School Shop

vol. VII no. 7

MARCH, 1948

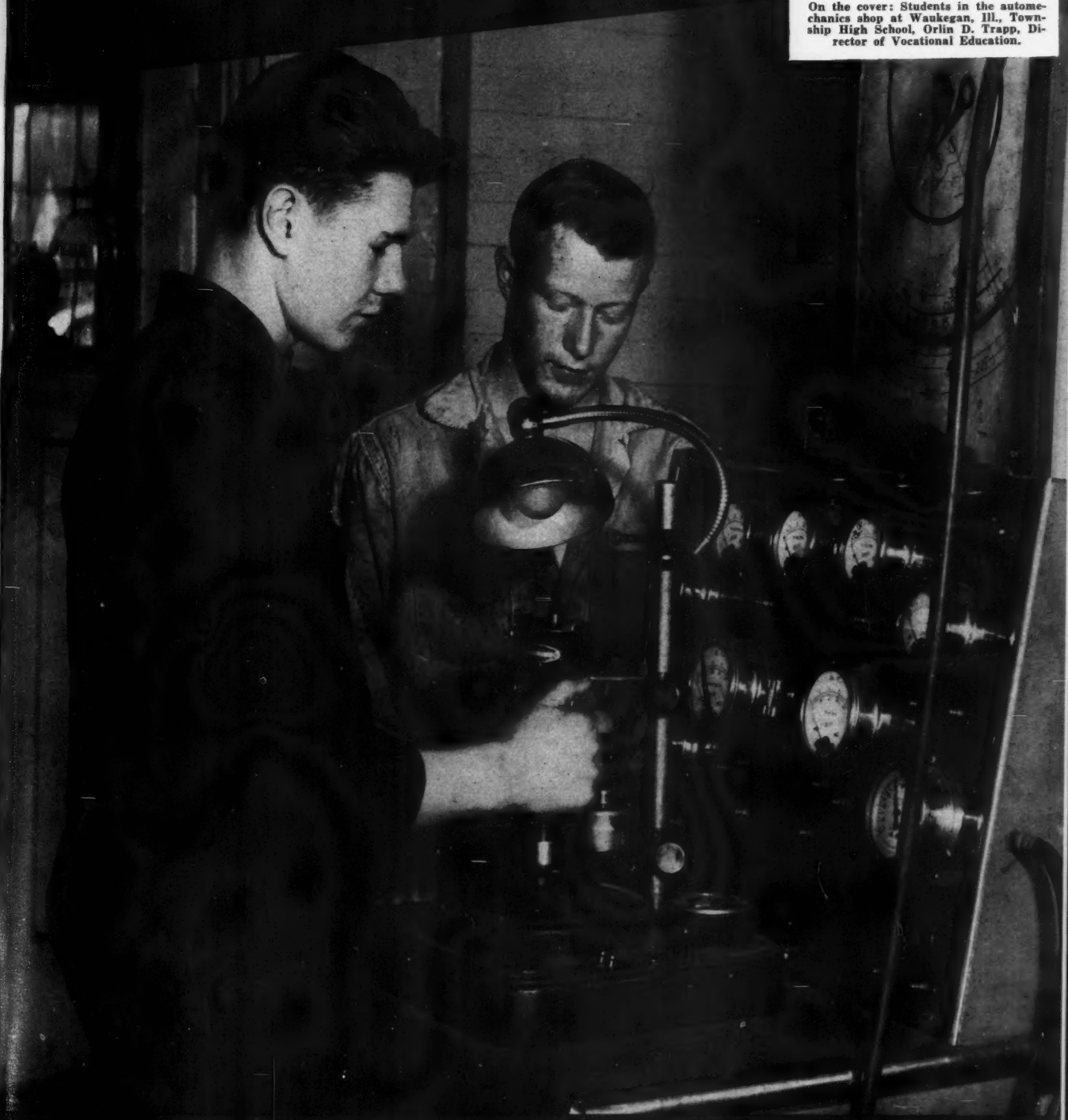
The Opinion Poll in Educational Planning
by Ralph C. Wenrich

Teaching Drafting to Apprentices
by Claude H. Ewing

A Unique Planer and Shaper Gage
by Clarence A. June

Audio-Visual Aids in Electronics
by Helge Hansen

On the cover: Students in the automechanics shop at Waukegan, Ill., Township High School, Orlin D. Trapp, Director of Vocational Education.



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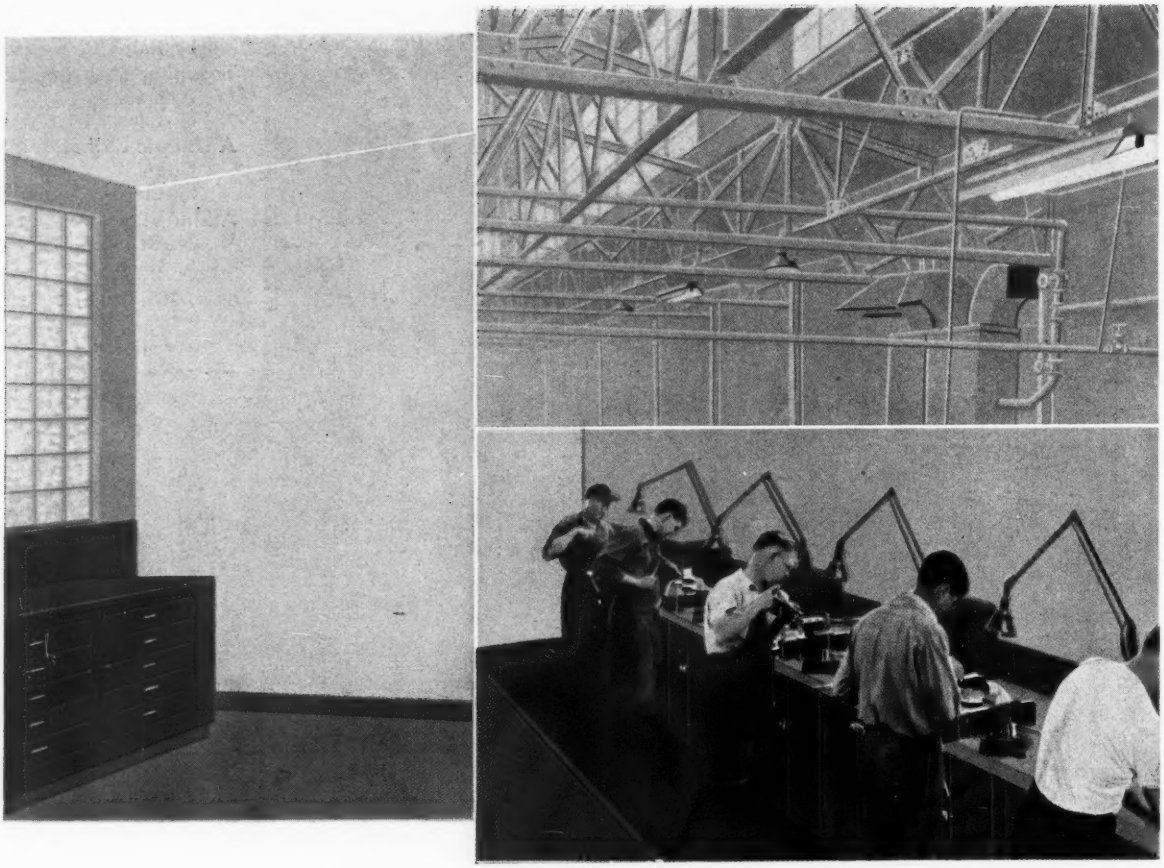

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School Shop

FOR INDUSTRIAL EDUCATION TEACHERS

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School Shop TALK

COMMENTS ON ISSUES FACING INDUSTRIAL EDUCATION

Industrial Education Rings the Bell

Time and again consumers of public-school education (pupils and graduates) have been queried about the value of the subjects they have taken. Most recently a report has been published in *The School Executive* of a study made of graduates of Highland High School, Fort Thomas, Kentucky.

Industrial education had rung the bell with the students in this high school, verifying previous studies of a similar nature.

The results of the study are interesting. Of those who had taken industrial-education subjects, only 5 percent wished that they had not done so. On the other hand, 45 percent of those who had taken Latin wished they had not taken the course. Moreover, a third of those who had not taken any industrial-education subjects wished that they had and would have elected them if they were to take their high-school work over.

What makes this study of particular significance to those of us in industrial education is that 68 percent of those graduates whose responses were tabulated had entered a college. This is far and away a higher percentage than the national average for high-school graduates which is somewhere around 20 percent.

If graduates of high school who later attend college find industrial-education subjects of importance to them, one of the props of the strictly academic-minded brethren is knocked right out from under them. Too long has industrial education suffered at the hands of counselors and administrators who look on shop subjects as alternatives to college-preparatory (so-called) subjects and attempt to channel students with aptitudes and interests out of such courses.

The college-bound student has found, as this study indicates, that shop subjects are important and of interest to him.

It is a mistake, of course, to contend that industrial-education subjects are primarily for college-bound students. Boys and girls in all curriculums can and should be offered courses in the industrial-education field to meet their needs.

The Famous Prosser Resolution

Buried in the appendix of the volume entitled *Vocational Education in the Years Ahead* is the now far-famed Prosser Resolution. This volume was the report of the Committee to Study Postwar Problems in Vocational Education which was appointed by John W. Studebaker, U. S. Commissioner of Education, early in 1944. The committee met late in the Spring of 1945 under the chairmanship of M. Reed Bass and the excellent report itself appeared later that year.

Since that time, the Prosser Resolution has stung the consciences of many leaders in vocational education and general education. A commission is now about to go into the whole problem as mentioned in these columns before.

In spite of what in educational circles amounts to a furor created by the Prosser Resolution, relatively few people know just what it is. To keep the record straight and our constituency informed, we take pleasure in reprinting it herewith:

It is the belief of this conference that, with the aid of this report in final form, the vocational school of a community will be able better to prepare 20 percent of its youth of secondary-school age for entrance upon desirable skilled occupations; and that the high school will continue to prepare 20 percent of its student for entrance to college. We do not believe that the remaining 60 percent of our youth of secondary-school ge will receive the life adjustment training they need and to which they are entitled as American citizens—unless and until the administrators of public education with the assistance of the vocational education leaders formulate a comparable program for this group.

We, therefore, request the U. S. Commissioner of Education and the Assistant Commissioner for Vocational Education to call at some early date a conference or a series of regional conferences between an equal number of representatives of general and of vocational education—to consider this problem and to take such initial steps as may be found advisable for its solution.

At the time Dr. Prosser introduced this resolution, which was adopted unanimously by the committee, he was director of the famous William Hood Dunwoody Institute of Minneapolis, Minnesota. He has since retired, but his influence through this resolution and through his many years of leadership in vocational education will continue for years to come.

Your Editor

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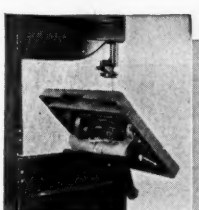

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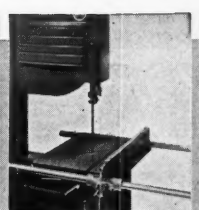

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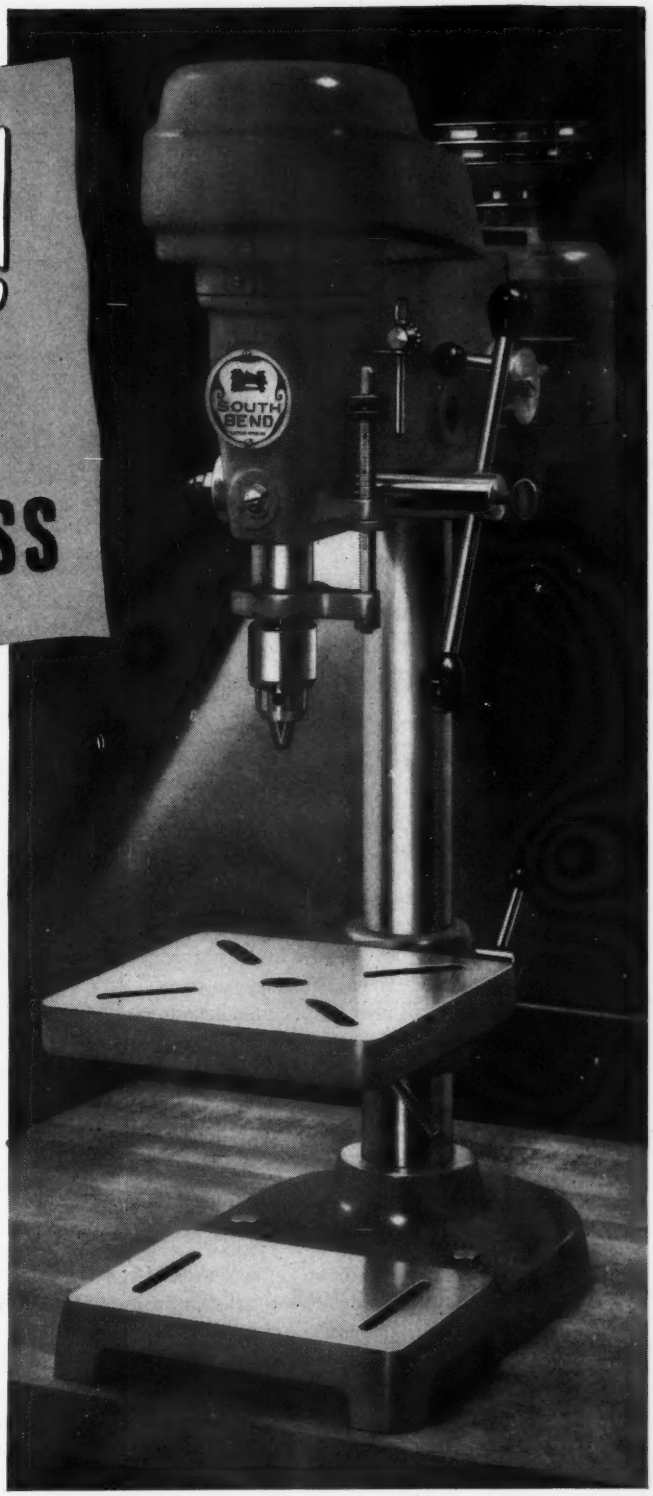

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The Opinion Poll

A NEW DEVICE IN EDUCATIONAL PLANNING

BY *Ralph C. Wenrich*

Ralph C. Wenrich

For the first time in the history of vocational education a whole state has been polled on the program with illuminating results. The author is Assistant Superintendent of Public Instruction for Vocational Education in Michigan.

TOO often professional educators plan programs of education without being fully aware of the opinions and attitudes of those to be served by the programs. True democratic education means that programs are planned and developed with the advice and counsel of all those who can contribute.

The opinion poll has been used effectively to get opinions and attitudes of people on commercial products and political and social issues. Its use for gathering information which might be helpful in educational planning has been less frequent.

Following the principle that the schools belong to the people and the people expect education to prepare both youth and adults to live and to make a living, it seemed quite natural that we should go to them for ideas in regard to vocational education. It was believed that this would produce information which would be helpful in planning a state program of preparation for occupational life. An attempt was made through an opinion poll to determine what Michigan people think about vocational education, including the type and character which they believed the schools should provide for both youth and adults.

Cross Section Polled

The opinion poll involved a sampling of people from various groups; each was given an opportunity to express his considered opinion in regard to training for occupational competency in Michigan's schools. Ballots were sent to over 500 high-school pupils in 20 communities; to every public school in the state to secure the opinions of superintendents, principals, vocational and nonvocational teachers; also, to a selected group of leading educators, including college presidents, deans of education, teacher trainers, and state department administrators. The State Congress of Parents and Teachers selected a random sample of their local associations and sent ballots to 500 parents. A sample of 150 farmers from various parts of the state was polled. The Detroit Chamber of Commerce sent ballots to 500 representatives of top management in business and industry. Over 300 veterans were polled as they came into counseling centers in many communities of Michigan. The people who participated in this study represent a cross section of the Michigan population.

The results of this opinion poll have proved not only interesting, but also helpful in determining the type, character, and extent of a program designed for the preparation of Michigan people for occupational life. It is hoped that this study will also be helpful to local communities in their planning to meet this need of youth and adults who must live by work.

Schools Lack Adequate Vocational Program

Responses to the first question indicated quite clearly that there is general agreement among all groups that the schools are not now giving adequate occupational preparation to young people. The question asked was, "Do you believe that the majority of Michigan schools offer the necessary basic occupational preparation for youth who immediately go to work upon dropping out of or graduating from high school?" Seventy-one and one-half per cent of the people who gave their opinions on this question said they believe the majority of Michigan schools are not now offering the necessary basic occupational preparation. The following table shows a detailed analysis of the responses by classes of individuals polled:

	Yes	*No*	*No Opinion*
High-school pupils	34%	45%	18%
Nonvocational teachers	14	85	1
Vocational teachers	9	90	1
Superintendents and principals	14	84	2
Leading educators	5	95	—
Parents	16	73	11
Farmers	22	59	19
Business and industrial management	22	65	13
Veterans	24	58	18
What they all think—Grand total	19	71.5	9.5

Public Wants More Vocational Education

In answer to the next question, "Do you believe that more preparation for occupational life should be provided by our schools?", 84 per cent of the people polled answered "Yes"; 9.5 per cent said "No"; and 6.5 per cent had no opinion. The people of Michigan are positive that the public schools should provide more opportunities for young people to prepare to earn a living. They point out that a majority of those in our labor force must use both their hands and their heads to provide for themselves and their families. If what the people think has any influence on what the schools provide, there will be an expansion of vocational education in all schools of the state.

Two-Thirds Want Personal Help

The next question, "Would you like to take any courses to help you in your present job or to help you to get a new job?", produced the following responses: 63 per cent said "Yes"; 20 per cent "No"; and 17 per cent had no opinion. It may be surprising to note that so many people would like to take additional training for occupational competency. The survey indicates that professional workers, as well as skilled and semiskilled workers, would like to have the opportunity for further study.

The Kind of Vocational Education the Public Wants

The opinion poll also attempted to find out what the people thought should constitute the character and content of an adequate vocational education program. The question was asked in six parts as follows: "If adequate occupational training and education were available in our high schools, how would you rate the relative importance of the following:

1. Broad, basic, general skills that will be helpful in a variety of occupations.
2. Very specific training for a specific job (such as welding, shorthand, dairying, cooking).
3. Fundamentals (such as arithmetic, reading, writing, spelling).
4. Personality development (such as ability to get along with others, accu-

racy, leadership, reliability, etc.).

5. Understanding the world of work (such as labor-management, occupational opportunities, labor laws, family relations, social security, production problems, etc.).

6. Occupational counseling and guidance services (such as learning about their interests, aptitudes and abilities, and helping them select a career and courses)."

The following table will give a summary of the answers to these questions:

Broad, basic general skills	40%	26%	30.5%	3.5%
Very specific training	25	27.5	37.5	9
Fundamentals	70.5	19.5	9.5	.5
Personality development	67.5	21.5	10.5	.5
Understanding the world of work	30.5	32.5	34	3
Occupational counseling and guidance services	50	28.5	19	2.5

When asked to indicate what aspects of occupational preparation they considered most important, those who participated in the poll clearly emphasized the need for a broad type of preparation for most youth and adults. Even those getting specific training for highly skilled jobs need the type of training and education which gives them the fundamentals and understandings of the world of work and develops desirable character traits. One might interpret the results as indicating a need for more stress on providing broad, basic skills and understandings. That there is a need for developing specific skills through apprenticeship, cooperative, and day trade classes is also implied. It is interesting to note that personality development, understanding of the world of work, and counseling rate high in importance.

This analysis of what Michigan people think about emphases on various aspects of occupational preparation is obviously incomplete. It does, however, very definitely indicate that there is need for incorporating in vocational education a much broader type of training and education than has been characteristic in the past.

Work Experience Wanted

Many educators are concerned at the present time about the place of work experience in the secondary-school program. It was, therefore, considered timely to raise the question, "Should supervised work experience for specific jobs and for credit be made available in a majority of high schools?" Eighty-five and one-half percent of the people participating in the poll answered in the affirmative, and only 6.5 percent gave a negative response, with 8 percent having no opinion. In light of this overwhelming sentiment in favor of work experience as part of the total secondary-education program, it would seem imperative that educators give serious thought to the further development and refinement of cooperative training as a means of preparing youth for occupational life.

Adequate Program Would Hold Students

The citizens of Michigan indicated that they believe there is a relationship between adequacy of occupational preparation offered by the schools and the holding power of those schools. This point of view is evidenced in their responses to the question, "Do you believe that more adequate occupational training in our high schools would reduce 'drop-outs' and increase the percentage who graduate?" Eighty-three percent of those polled said they believe we can reduce drop-outs by increasing and improving vocational education; 10 percent said they did not believe this to be true; and 7 percent had no opinion.

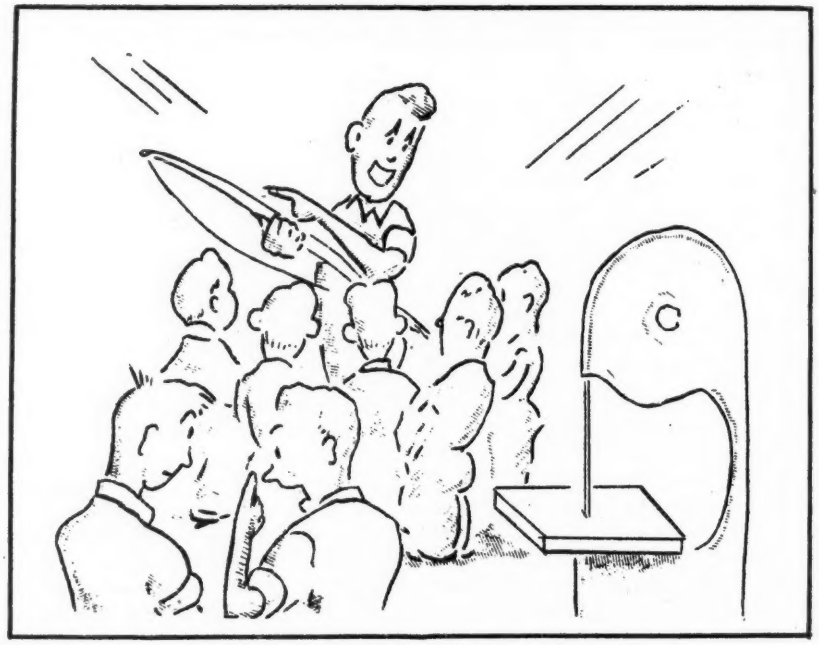
A number of other questions were raised in connection with this opinion poll, many of them pertaining strictly to the situation in Michigan. The complete report on the opinion poll was published by the Office of Vocational Education, Department of Public Instruction, in a bulletin titled, *What Michigan People Think About Vocational Education Needs.*

Even though the results of this opinion poll may not be considered as conclusive evidence, we get from it the assurance that the people of Michigan do want more and better programs which will prepare youth and adults for the work of the world.

Leaders (?) in Industrial-Arts Education

By Marcus Fitzgerald

Hobby-Horse Joe



"I don't care if you don't have any Indian blood, you'll be smart if you make a bow and some arrows!"

HOBBY Horse Joe is the industrial-arts teacher who rides his hobby in the shop. He expects boys and girls to be as enthusiastic about the hobby as he is himself. Of course, Joe may change his hobby from time to time. One year he may be a bug on bows and arrows, whittling another, model airplanes a third year. But despite his own shift in interest he expects pupils to be equally interested in any choice of hobby.

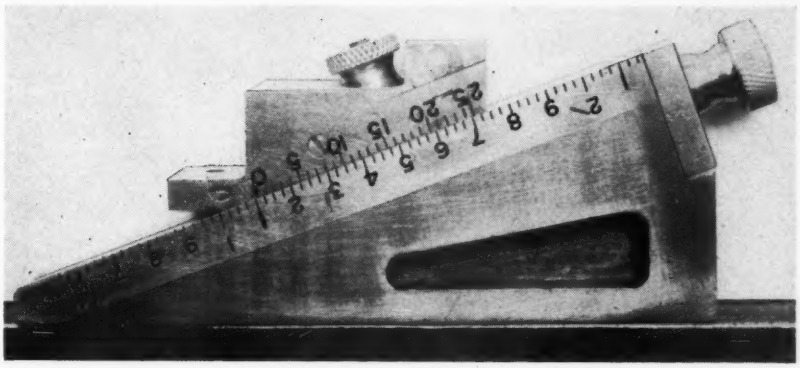
Hobby Horse Joe devotes so much shop time to instruction in the chosen hobby that the pupils have little time for any other type of activity. Joe develops the shop around the hobby, keeps supplies on hand for the hobby only, and discourages generally pupil deviation from the anointed hobby.

Teacher hobbies can be stimulating to pupils when the hobbies are properly harnessed, but when misused they can cause the entire industrial-arts program to go off on a tangent.

A Unique Planer and Shaper Gage

BY *Clarence A. June*

This is an advanced machine-shop project calling for the utmost in skill and precision. The result is valuable instrument for the student's tool box. Clarence A. June teaches at the J. M. Wright Technical School, Stamford, Conn.

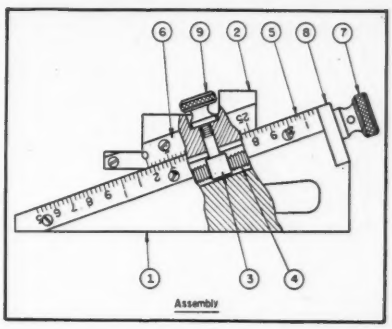


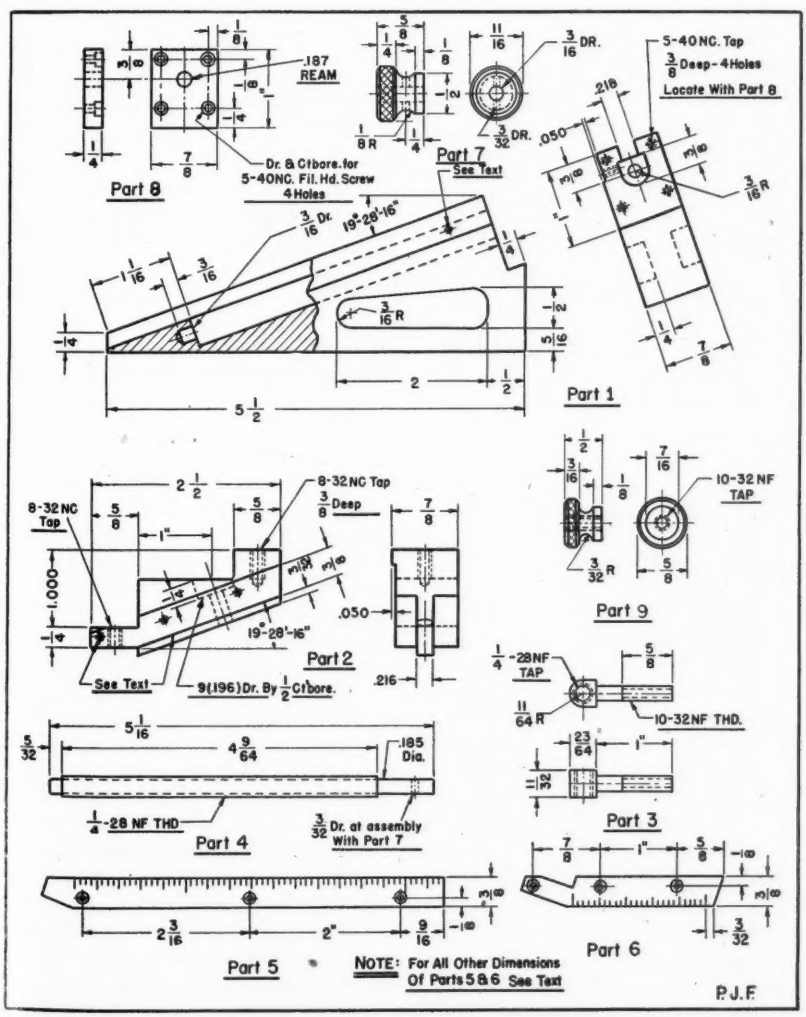
TESTED PROJECT

ADVANCED students in machine shop or tool-and-die training will find this planer and shaper gage project one that will test their accuracy and skill. This type of gage cannot be purchased and the student who completes one will be proud to have such an unique instrument in his tool box.

New features are incorporated in the gage and include a direct-reading scale, which eliminates the use of a micrometer for setting, and a mechanical feed for easy adjustment.

Parts 1 and 2 are made of tool steel and are hardened and ground. It is very important that the angle of 19°-28′16″ be held as accurate as possible for correct reading of the gage. The three small tapped holes in parts 1 and 2 are #2-56 N.C. threads and are located with parts 5 and 6, respectively, at assembly.





The holes in parts 5 and 6 are drilled and countersunk for flat-head machine screws. The shapes of parts 5 and 6 are obtained by using ⅜″ wide, cold rolled steel by .050″ thick. By placing them in the .050 undercuts of parts 1 and 2 and scribing their outline and trimming to scribed lines, they will fit parts 1 and 2 more accurately than by giving the dimensions on the detail drawings.

The length of the shortest divisions on scales 5 and 6 are .093″ long, the next length .125″ long, and the longest lines .156″ long. The spacing of the divisions on scale 5 are .075″ apart while on scale 6 they are .072″ apart. These divisions must be accurate and are put on the scales with the use of a milling machine and dividing head. A fixture should be made to hold the scales securely. The figures are etched on the scales by using the wax and acid method.

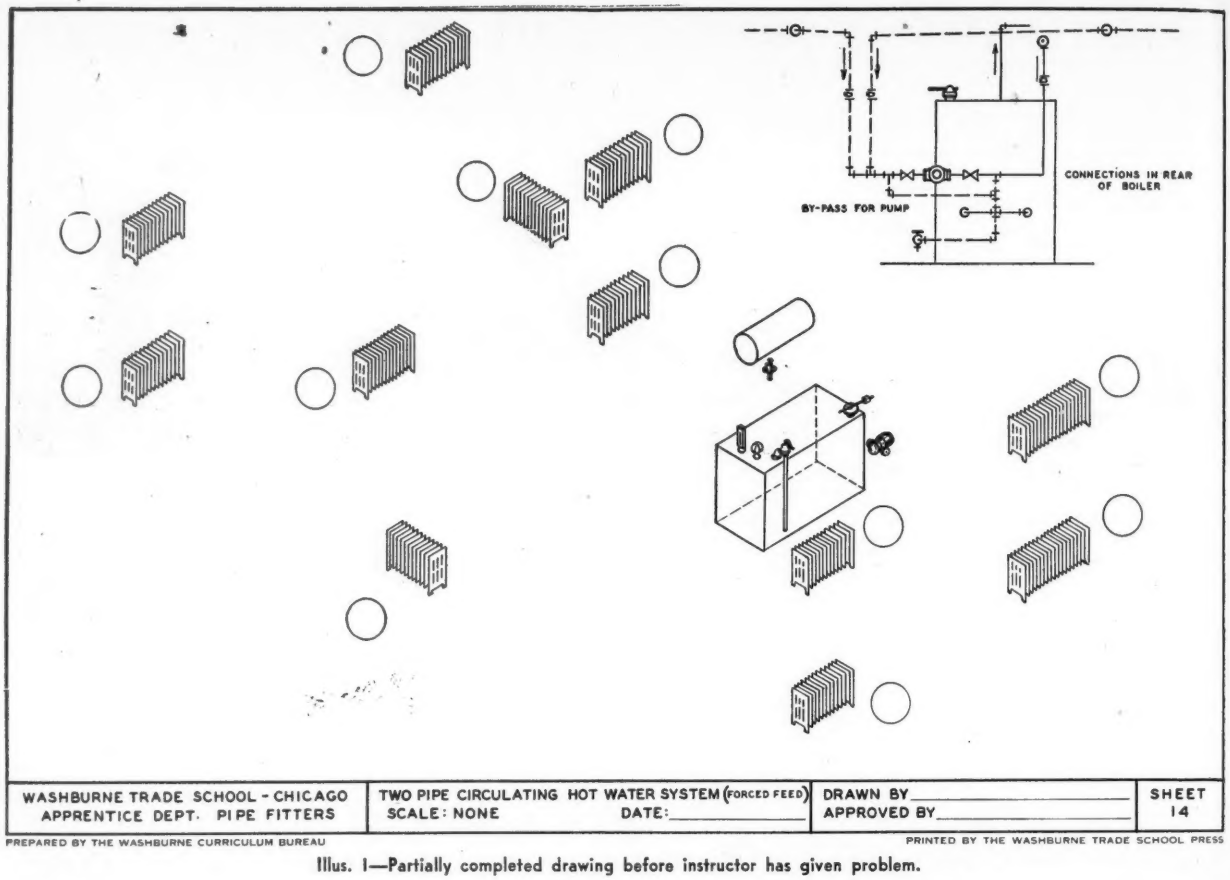
The tongue on part 2 should be undercut, which is not shown on the detail, so as to provide clearance for the grinding wheel.

A special cutter must be made for the "U" shaped channel of part 1.

The class of fit for the thread on part 4 and the tapped hold in part 3 should be a #4 so as to prevent backlash.

When assembling, set the gage with a micrometer for exactly 1″ and clamp

(*Continued on page* 11)



Illus. 1—Partially completed drawing before instructor has given problem.

Teaching Drafting to Apprentices

A Technic for Giving Students Real Working Knowledge

BY *Claude H. Ewing*

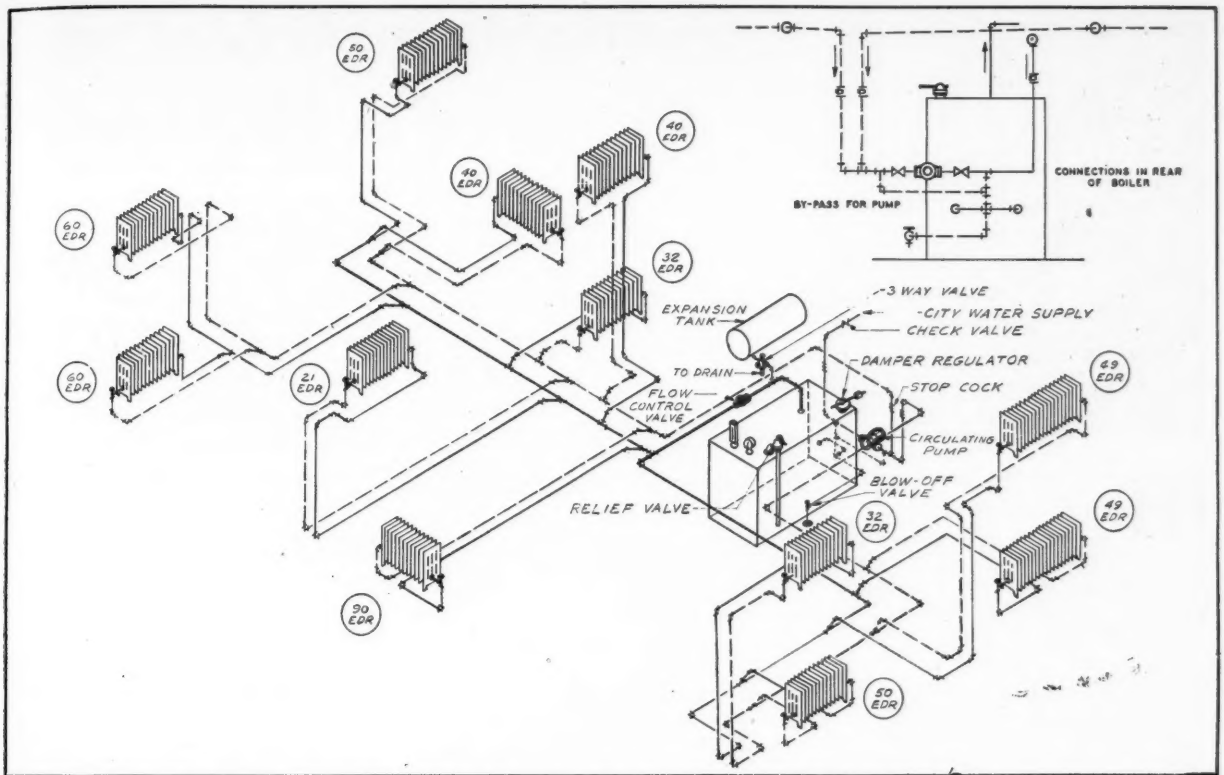
Related drafting has always been a sore spot in apprentice training. Here is a technic for making it apply to trade problems without involving a lot of "busy work." Dr. Ewing is Supervisor of Vocational Curriculum, Chicago, Ill., Public Schools.

THE organization of courses of study for apprentice training has too often fallen into a pattern which includes mathematics, science, and drafting. The mathematics has gradually become meaningful through the use of ruler fractions and measurements of the trade. The science is the related technical information of the field in which training is being given. These are not falling as short of the real mark as is the drafting.

Although blueprint reading and shop sketching have been recognized as more valuable than drafting especially in the machine-tool trades, some other occupations do not lend themselves as well to these and therefore "drafting" is taught. "Drafting" too often means the usual mechanical drawing of many objects totally unrelated to the occupation. In many instances where real consideration is given to the selection of drafting problems related to the field of training, apprentices are required to follow antiquated technics and time-consuming procedures, such as inking all drawings.

There is no intention of making a blanket condemnation of the apprentice teaching but merely to point to the need for improvement. It is recognized that once one becomes aware of the need for improvement, a beginning has been made. In the training of building-trades apprentices, it is necessary to develop the ability to make shop sketches and read blueprints and other shop drawings intelligently. To accomplish this, a certain amount of drafting skill is an effective device. Having acquired the information and skill presented, to continue to make plate after plate of a similar type becomes "busy work."

In the development of a course of study, the three most commonly included subjects unfold together. They are integrated and correlated as needed by the occupation. If the school time is divided equally or if a schedule is set allowing a definite time schedule for each subject, the mistake may be made of allowing time for busy work to be assigned. To illustrate what may result in such a situation and the solution that was found, the teaching of drafting to pipe fitters' apprentices is used. In the study of heating the mathematics and science as applied to various types of heating systems are studied while the apprentice makes a drawing of the plant in a predetermined situation. When cognizance was first taken of the need for improving the instructional material in this field, it was found that apprentices were spending from 16 to 20 hours on each heating layout. Boilers and radiators were being drawn and inked in a painstaking manner. The apprentice with artistic ability usually produced



Illus. 2—Student's solution, in pencil, of problem given by instructor.

work which gave the impression that he knew what he was doing. The apprentice who was really getting the information needed for intelligent installation of a heating plant often failed to make radiators and boilers look pretty enough to impress one with his real attainments in meaningful science and mathematics.

The time spent on these drawings retarded progress in the acquisition of the knowledge of science and mathematics needed by the apprentice. Realization of the fact that during apprenticeship related-subjects time we are not concerned with making draftsmen caused attention to be given to this situation.

Pictured with this article is the solution arrived at by the instructors in this department working with the curriculum bureau staff.

Drawings were made on tracing cloth, 12" x 19", and inked. These drawings, as shown in illustration No. 1, presented a situation with boiler and radiators placed. The amount of heat needed at each radiator was left to the instructor for determination at the time the job was assigned. Note that special connections and especially new information is given on the plate to guide the apprentice.

If the related science and mathematics needed for the completion of the heating plant layout has been learned, the apprentice will be able to proceed without difficulty. The drafting thus works as a check on the progress being made in other subjects.

The inked tracings were photographed, deep-etched plates made, and the printing done by offset in the school print shop. The ink used for printing was a gray about the color of lead used in a drafting pencil. The drawing completed by the apprentice results in uniform line color and the lack of emphasis which might appear if black were used for the equipment pictured. Illustration No. 2 shows the drawing completed by the apprentice.

The time required averages two hours per plate, making possible the lay out of eight to ten heating plants in the same time previously given to drawing radiators and boilers on one heating-plant layout. In this we have changed from a great amount of busy work to an effective teaching procedure.

A close evaluation of the objectives of building-trades apprentice-training courses in particular shows little justification for the great waste of time resulting from the teaching of drafting except for its use as a tool for teaching. The partially completed plate can be so organized as to eliminate such waste and to attain a greater degree of efficiency in that more material may be covered in the time available.

Visual Aids . . . . *from page 13*

partment, General Electric Co., Schenectady, N.Y.

School Service Department, Westinghouse Electrical and Mfg. Co., Box 1017, Pittsburgh 30, Penna.

American Telephone and Telegraph Co. (A catalog is available from local Bell Telephone Co. offices.)

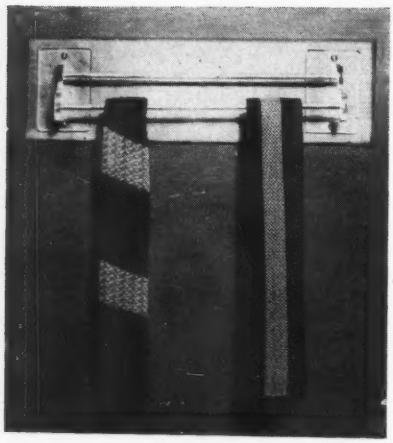
In closing, the author wishes to state that the above list does not exhaust the field by any means. The fundamental purpose has been to list basic teaching aids. The teacher of electronics should familiarize himself with at least these sources.

Gage . . . . . . *from page 9*

with clamping nut 9. Then adjust scales 5 and 6, clamp and spot for #2-56N.C. tapped holes. While the gage is still clamped, the feed knob (part 7) is spotted and drilled with part 4 and a drive pin inserted.

The #8-32 N.C. tapped holes in part 2 permits the use of extensions as on other types of gages but due to the mechanical feed knob it is not possible to stand this gage on its shorter leg to obtain greater heights.

Combination Wood and Plastic Tie Holder



BY *William D. Chatfield*

Combining utility and interesting use of materials, this project is excellent for elementary general shop students and can be used to teach much about tools, operations, and materials. William D. Chatfield is Assistant Professor of Industrial Arts, Teachers College of Connecticut, New Britain.

TESTED INSTRUCTIONAL PROJECT

THIS combination wood and plastic tie holder is the type of project that the average boy in the school shop likes to make. It is colorful and attractive, being made of walnut and Plexiglas. Parents appreciate having such a project for the home.

The tie holder offers a challenge to the builder and can be used to teach many things about tools, operations, and materials. The wood piece must be carefully made and finished. The plastic parts must be well cut, polished, drilled, and tapped. Care must be exercised in assembling so that the finished project will be square and true and the finish kept free from marks and scratches.

Walnut is specified for the back piece but any wood of the same dimensions can be used. The plastic back can be made out of ¼" Plexiglas, either clear or colored. The brackets are ¼" plastic, either clear or colored.

The plastic brackets can be fastened to the plastic back piece by bolts which will illustrate the tapping operation to the pupil. An alternative is to cement this joint, using acetic acid or commercial cements for acrylic plastics.

The pupil will be delighted with the opportunity to work with plastics and amazed at the ease with which it can be fabricated. The jig saw or a slow-running bandsaw with fine teeth can be used to cut the material.

The finishing operation will be the time-consuming element. The first operation after cutting is to file. Then use abrasive paper down to 4/0. Buffing with tripoli will give a smooth final polish, or it can be done by hand with pumice and rottenstone or even tooth powder. Waxing will keep the pieces free from lint.

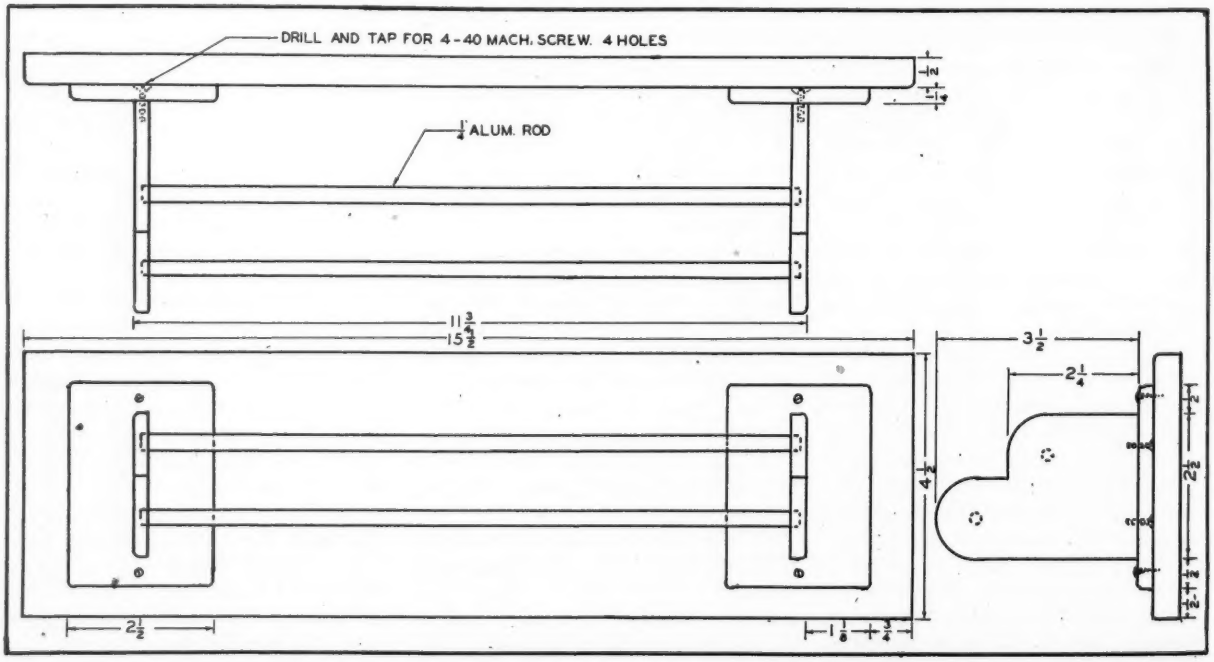
A shellac finish for the walnut back piece is excellent, if the shop does not have spray equipment. It will dry in ten minutes so that dust particles in the air will not spoil the finish. Three coats are needed with a little rubbing down between coats with fine steel wool. The first coat should be a wash of about 50-50 shellac and alcohol. The final step is an application of good furniture wax.

Several methods can be used for fastening this holder to the wall, depending on the wishes of the maker. Metal hangers can be used or it can be drilled and screwed to the wall.

To help beginning students and to illustrate the use of jigs, the shop teacher may wish to make a jig for laying out the holes.

Following are suggested information units that can be developed for use with this project:

1. Care and use of tools.
2. Care and use of machines.
3. Information about wood from the forest to the shop.
4. The story of shellac.
5. The story of alcohol.
6. The history of plastics.
7. The making of Plexiglas.
8. Cutting Plexiglas.
9. Finishing Plexiglas by hand with the buffer.
10. Drilling and tapping Plexiglas.
11. Teaching the elements of design.



Audio-Visual Aids in Electronics

BY *Helge E. Hansen*

Here are practical suggestions for setting up a program for using audio-visual aids to learning in radio and electricity courses. Helge E. Hansen is a member of the staff of the Audio-Visual Education Center, University of Michigan, Ann Arbor, and a former shop teacher.

WHY have visual aids not been used more frequently by the average teacher of electricity and radio, or electronics? Why are teachers not aware that visual aids make teaching more effective and vital to the student? How many teachers in this field know the extent of the excellent aids available for him to enrich his teaching?

Experimentation with some of these visual aids would show the teacher-sceptic that he is missing a good bet. Good films, properly used, can help a great deal in teaching electronics.

The remark is often heard that there is not time enough to teach the theory necessary to accompany a laboratory course. Or the statement is made that the demonstration is adequate for getting across the key ideas to the student. Both statements are open to question.

Visual aids can be used to step up the student's comprehension of the theory side of the course. They are also useful for insuring that the key ideas in the demonstration get across.

For instance, a good visual aid can implement any demonstration. The motion picture or filmstrip can show continuity of action and give completeness to the demonstration. Visual aids are supplements to good demonstrations. Animation clarifies terms, diagrams, visualization, and comprehension.

A motion picture permits repetition, fixed and accurate explanations, and open discussion. It is good practice to show a film more than once, parts of it several times. It is advisable to turn off the sound track when showing a film for the second or third time and to have the instructor add his comments.

Often with electronics films it is highly advisable to use the stop-on-film mechanism for longer explanations. Modern projectors do not damage the film if it is stopped while the projector is running and a single frame is shown. This gives an opportunity for elaboration of the more difficult points.

The resourceful teacher will always find ways to use visual aids more and more effectively as he gains in experience and confidence.

The filmstrip is an excellent device to use in courses specializing in electrical repair projects. The pupil should be taught to operate the projector and should study the filmstrip alone or in small groups. A filmstrip can be moved forward and backward at will in the projector and, thereby, permits prolonged study until complete understanding is reached.

Filmstrip projectors do not need dark rooms or long throws or large screen areas. It is recommended that the shop instructor install these projectors in the shop and purchase key filmstrips which are applicable to their courses. For screens, an area on a wall painted with a flat white water paint is highly satisfactory.

Filmstrips which accompany motion pictures are very valuable for detecting weaknesses in the student's comprehension and helping to overcome them.

Below are listed filmstrips and 16mm motion pictures which have been found valuable in teaching electronics. No attempt has been made to include sponsored materials of which there is an abundance of high quality.

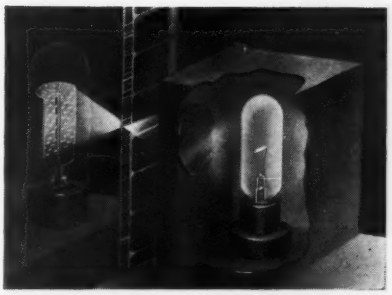
The teacher with imagination will want to experiment with the use of some of these films. My guess is that he will find them well worth the effort.

The following 16mm motion pictures can be purchased from Encyclopaedia Britannica Films, Inc., 20 N. Wacker Drive, Chicago 6, Ill., or rented from most of the state film libraries:

Atomic Energy
Atomic Power
Electrons
Electrochemistry
Electrodynamics
Electrostatics
Elements of Electrical Circuits
Home Electrical Appliances
Molecular Theory of Matter
Primary Cells
Series and Parallel Circuits
Sending Radio Messages
Receiving Radio Messages
Radio Antennas
Sound Recording and Reproduction
Vacuum Tubes in Radio

Castle Films, Inc., 30 Rockefeller Plaza, New York 20, N.Y., sells the following films. They are also available on a rental basis from most of the university extension film libraries as well as other agencies. (Note: Most of the Castle films were originally produced for the U.S. Office of Education, the armed forces, or other governmental agencies.)

The Electron, an Introduction
The Diode
The Triode
Cathode Ray Tube
Rotating Magnetic Fields
Cable Surface Wiring
Electrical Circuit Faults
Squirrel-Cage Rotor Principles
Split-Phase Motor Principles



A scene from the slidefilm, "The Diode—Principles and Applications," distributed by Castle Films. The photoelectric cell is shown as a special type of diode.

Single and Polyphase Circuits
X-ray Inspection
Radio Receivers, Principles
Radio Antennas
Radio Operator Training
The Battery, Ignition, and Electrical System
Joining Solid Conduit
Soldering Lugs and Splicing
Wire Size and Voltage Drop
Porcelain Protected Surface Wiring
Three-Wire Service Entrance
Installing Surface Metal Raceway
Roughing in Nonmetallic Sheathed Cable
Repulsion Motor Principles
Direct-Current Controllers
Across-the-Line Starters
Reduced Voltage Starters
Wound Rotor Controllers
Installing Conduit
Power Bending Conduit
DC Motor, Overhaul and Rewinding
Split-Phase Motor Rewinding
Three-Phase Motor Rewinding
Repulsion-Induction Motor, General Overhaul
Refrigeration — Checking Electrical System
Principles of Gas-Filled Tubes.

(All of the above films have 35mm filmstrips to accompany them. The filmstrips present key points from the film and are valuable from an instructional standpoint to use to fortify the learning from the motion picture. The filmstrip can also be used separately to advantage.)

Motion pictures without filmstrips are as follows:

Capacitance
Inductance
RCL Resistance-Capacitance
Radio Shop Technics
Special-Purpose Vacuum Tubes
Oscillators
Rectangular Coordinates
Vectors
Periodic Functions
Tube-Tester Operation
Signal Generator Operation
Audio Oscillator Operation
Volt-Ohmeter Operation
Elementary Electricity

The Jam Handy Organization, 2821 East Grand Blvd., Detroit 11, Michigan, has produced the following series of 35mm filmstrips:

Electrical Shop—21 study units.
Basic Electricity—12 study units.
Automotive Electrical Systems—6 study units.

The following firms have excellent instructional materials. Teachers of electricity will find it worthwhile to send for their catalogs of audio-visual materials:

Visual Instruction Section, Education De-

(*Continued on page* 11)

Make This Combination Lamp and Letter Holder

BY *Donald Maley*

Teachers of bench metalwork will find this lamp project has a couple of unusual fillips—a holder for letters and a monogram detail. Donald Maley is an instructor in the Industrial Education Department, University of Maryland, College Park, Md.

TESTED SCHOOL SHOP PROJECT

THE combination lamp and letter holder is a useful and decorative piece of household furnishing. The project combines the principles of a well designed lamp as well as the added feature of the letter holder which greatly increases its usefulness without destroying any of its beauty. It is a fixture that may well find its place in the living-room, study, library, or on a bedside table. The design is simple, yet artistic enough to lend itself appropriately to most any circumstance. The lamp is made more distinctive, and a personal touch is added, by placing the initials or personal monogram in the center of the letter holder.

As a cold-metal project, it involves a number of vital operations and work experiences for the boy. Such experiences include wiring, riveting, choice of rivets, hammering or peening the metals, bending the various shapes, flaring the ends of the pieces, laying out, designing, drilling, tapping, use of the hacksaw, filing, soldering, finishing, and others.

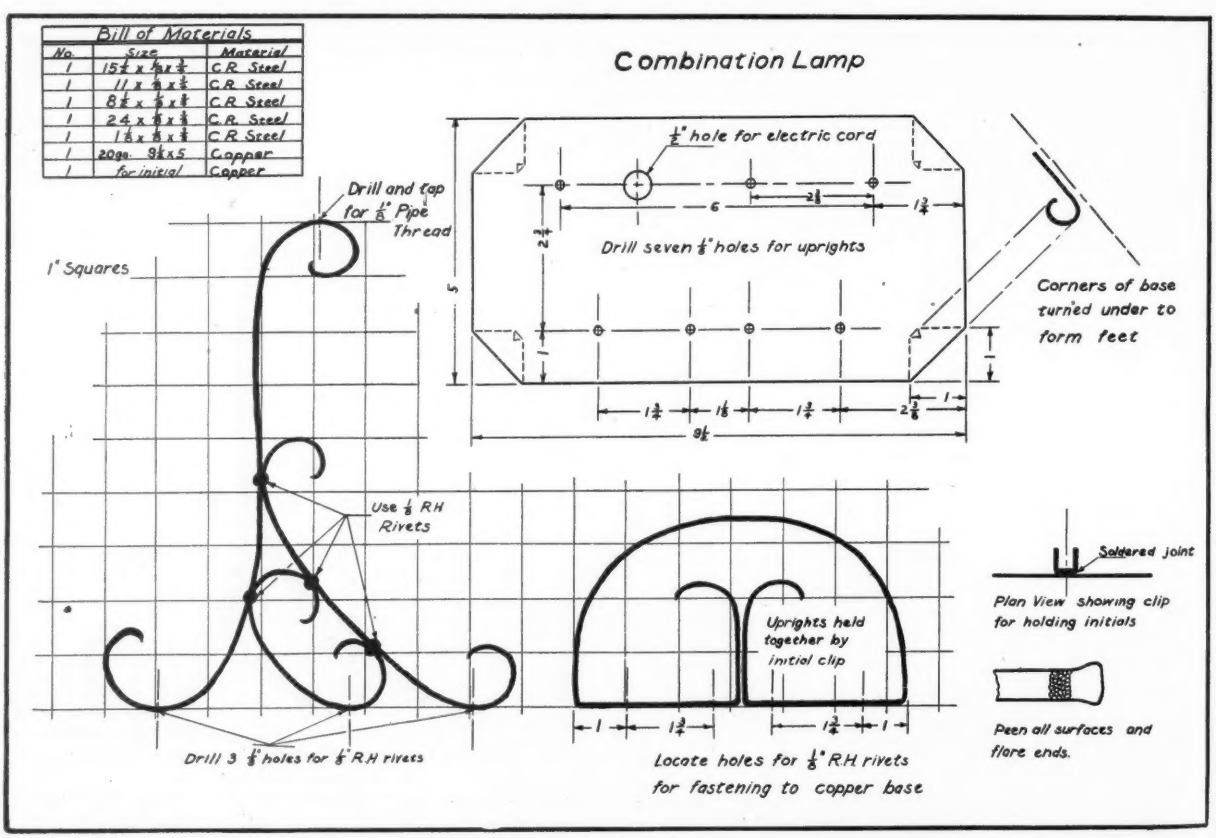
The lamp further embodies the principle of value to the student in that the end result is a practical yet attractive piece of work that may well serve his own needs, or perhaps as a present to mother, dad, or a friend. The same features and uses may also provide the vital element of interest in making the project.

The tools and equipment necessary to make the lamp are found in most every metalworking shop.

The strap-or band-iron pieces are peened on the flat surfaces. The copper base is also peened on the top surface to give it an added touch of beauty. Round-head rivets are used to fasten the pieces together.

A special feature of the copper base is the manner in which the corners are turned back under to form the four feet upon which the lamp rests. This has a special advantage in that it raises the lamp up from its resting surface as well as providing a certain degree of safety from scratching the surface upon which it is placed. It also permits the light cord to be led out through the bottom of the lamp.

The electric light socket is attached to the top of the lamp by means of a ⅛" standard pipe bushing which is common to most light sockets. The shade may be of any appropriate color for the


Bill of Materials
No. Size Material
1 15½ x ½ x ⅛ C.R. Steel
1 11 x ½ x ⅛ C.R. Steel
1 8½ x ½ x ⅛ C.R. Steel
1 24 x ½ x ⅛ C.R. Steel
1 1⅝ x ½ x ⅛ C.R. Steel
1 20ga. 9½ x 5 Copper
1 for initial Copper
Combination Lamp
½" hole for electric cord
Drill and tap for ⅛" Pipe Thread
1" Squares
Drill seven ⅛" holes for uprights
Corners of base turned under to form feet
Use ⅛ R.H Rivets
Drill 3 ⅛" holes for ⅛" R.H rivets
Uprights held together by initial clip
Locate holes for ⅛" R.H rivets for fastening to copper base
Soldered joint
Plan View showing clip for holding initials
Peen all surfaces and flare ends.

local setting in which the lamp is placed, but the shape of the lamp lends itself well to a shade that is oblong in shape, rather than round.

The initial is an added feature that will provide an opportunity for the student to use his creative abilities in designing and working out a pleasing set of initials. The initials are made of 20-gage sheet copper and are soldered onto a "U" attachment made of strap iron. The initials are held in place on the letter-holder rack by the spring tension of the two center vertical portions of the holder. In this way, the initials may be easily removed or changed, or a different design added to the front of the lamp.

Finish on the Project.—The base of the lamp is given a high polish either by buffing or by rubbing it with fine steel wool. Then a coat of clear lacquer is applied to seal the lustre of the polished copper. The initial is finished in a similar fashion. The steel parts are all given a coat of dull black lacquer over the peened surfaces. After drying sufficiently, the dull black lacquer is rubbed over with an abrasive to remove the lacquer from the top surfaces, and in turn leaving it deposited in the depressions made as a result of peening. A finish coat of clear lacquer is then applied over the entire surface, thus giving the metal an attractive finished appearance with highlights and blackened surfaces providing a pleasing effect.

NEWS

What's Doing in the Field of INDUSTRIAL EDUCATION

New Vocational School

A NEW technical-vocational school is planned at Hammond, Ind., according to Fred Benson, city director. A bond issue for two million dollars will cover the cost.

Convention Calendar

SPRING conventions for teachers of industrial education are as follows:

March 29-April 1, New York Vocational and Practical Arts Association, Hotel Statler, Buffalo, N. Y.

April 1-3, Illinois Vocational Association, Morrison Hotel, Chicago, Ill.

April 8-10, Texas Vocational Association, Rice Hotel, Houston, Texas.

April 8-10, Michigan Industrial Education Society, Grand Rapids, Mich.

April 15-17, Indiana Industrial Education Association, Turkey Run State Park, Turkey Run, Ind.

May 6-8, American Industrial Arts Association, Washington, D. C.

May 7-8, Wisconsin Association of Vocational and Adult Education, Northland Hotel, Green Bay, Wis.

June 16-18, Pennsylvania Vocational Association, Eagles Mere, Pa.

Training Directors Meet

THE Fourth Annual Conference of the American Society of Training Directors will be held in St. Louis, March 4-6, with headquarters at the Hotel Jefferson. The organization is made up of training directors from business and industrial organizations.

Oswego Conference

THE tenth Annual Spring Conference for Industrial-Arts Teachers will be held at the Oswego, N. Y., State Teachers College on April 29-30.

Kenosha Plans Building

CONTRACTS have been awarded for the construction of a million-dollar vocational-school building by the Kenosha, Wis., Board for Vocational Education.

Massachusetts Group Meets

THE Massachusetts Industrial Education Society met on January 31 at the Sheraton Hotel, Boston, for its annual get-together. Speakers included Professor R. O. Billett of Boston University and Walter B. Pohle of the Spray Engineering Co.

The Only 10" TILTING-ARBOR SAW which can be successfully driven by low-cost standard (not special) motors, gas engine or line shaft by using "rolling drive pulley."

BOICE-CRANE No. 2514

Has ¾" arbor, the largest arbor and heaviest bearings of any 10" saw. Handles heavy overloads.

Motor is entirely separate from machine and away from the dust, keeping vibration from the saw arbor and eliminating needless wear on trunnions and slide ways. With motor weight off the arbor, the arbor always stays accurately locked in any tilted position.

28" long cast iron rip fence, precision ground both sides, features one-knob lightning-fast automatic control of both front and rear locks. Fence is aligned as it micro-sets, saving the necessity of reaching over blade to set or adjust fence. Secure and accurate alignment on first lock-up.

Conveniently grouped controls for quickly, accurately tilting, raising and lowering saw blade. Positive locks. Easy-to-read accurate gauges. Large dust chute encloses lower portion of blade, and discharges sawdust away from motor.

Finest miter-gauge yet designed, with patented plunger-setting and adjustable stops for 45° and 90°.

Extra large trunnions for super-accurate saw blade alignment. Approved safety guard hood shields entire saw-blade, tilts with blade. Ribbed steel splitter, prevents work binding. Anti-kickback feature.

Powerful V-belt drive, capable of transmitting up to TWO horsepower. Available in bench or floor models.

SPECIFICATIONS:

Table: 20" x 27"; with extensions 38" x 27".
Saw Blades: 10" dia. max.—Dado Heads 6" dia. x 1-1/16" wide.
Depth of Cut: Saw Vertical: 3". Saw Tilted: 2⅛".
Cut-off Capacity: 13" clear before blade.
Bearings: New Departure Grease-sealed.

BOICE-CRANE POWER TOOLS

- Designed for ready adaptability to a wide range of projects, fewer machines are needed to fill all your requirements.
- As nearly 100% safe as modern devices permit.
- Of just the right size for school shops, they permit more efficient layouts than larger equipment.
- Durably constructed, they can take a beating which would incapacitate most machines.

For a guarantee of satisfactory service, specify only the products of manufacturers who SPECIALIZE in producing power tools rather than making them a sideline.

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Two Ideas for the Print Shop

BY *Albert W. Bailey*

Bassett Junior High School, New Haven, Conn.

Idea and Project File

WHILE creative designing and planning of printing jobs is to be encouraged on the part of the student, a file of ideas and sample jobs is helpful for advanced classes working on individual projects. A 12" square box about 14" deep makes a good file and can be quickly made in the wood shop.

Samples of outstanding jobs may be mounted on 11" x 14" poster blanks or filed in large envelopes. Tabs for indexing can be made by bending a piece of cutting rule to the desired shape and making a die for cutting out on a platen press. By shifting the gage pins once and reversing half the stock after it has been cut, four differently spaced tabs may be produced. Tabs should be cut from 11" x 15" blanks of a contrasting color, labelled, and arranged alphabetically.

The following list of classifications should cover most of the jobs done in a school print shop: ballots, block prints, blotters, booklets, book marks, book plates, calendars, cards—business, cards—calling, cards—greeting, cards—identification, certificates, envelopes, forms—departmental, forms—office, invitations, labels, menus, miscellaneous, posters, programs, score cards, signs, tags, tickets, and title pages.

Layout and Specification Sheet

PLANNING the layout and specifications of a printing job is just as important as preparing blueprints for construction. Accurate diagramming saves time, and does away with guess work and hit-or-miss composition.

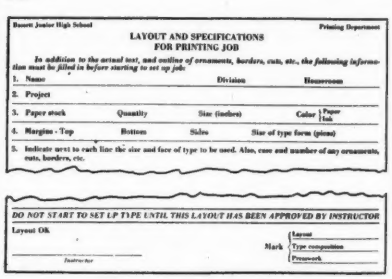
In the school print shop every student should be required to make a sketch of each job which he plans to set up and print, indicating cuts, borders, rules, and the size and face of type for every line.

The layout should also show the width of margins; size of the type form; kind, color, and quantity of papers to be used; color of ink; and other information. Thus, after the instructor has approved the layout and the student starts to set the job, he needs little or no assistance to complete it.

This layout sheet is also helpful to the student for reference in distribution of materials after the job has been printed.

With a press proof attached to the layout sheet, it also serves as a marking record for the instructor.

The following illustration shows a layout sheet on which are printed instructions for the students and blanks for the required information to be filled in.



Bassett Junior High School — Printing Department

LAYOUT AND SPECIFICATIONS FOR PRINTING JOB

In addition to the actual text, and outline of ornaments, borders, cuts, etc., the following information must be filled in before starting to set up job:

1. Name ____ Division ____ Homeroom ____
2. Project ____
3. Paper stock ____ Quantity ____ Size (inches) ____ Color ____ Paper / Ink
4. Margins - Top ____ Bottom ____ Sides ____ Size of type form (picas) ____
5. Indicate next to each line the size and face of type to be used. Also, case and number of any ornaments, cuts, borders, etc.

DO NOT START TO SET UP TYPE UNTIL THIS LAYOUT HAS BEEN APPROVED BY INSTRUCTOR

Layout OK ____ Mark (Layout / Type composition / Pressroom)

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AMERICA'S OUTSTANDING BENCH LATHE VALUE

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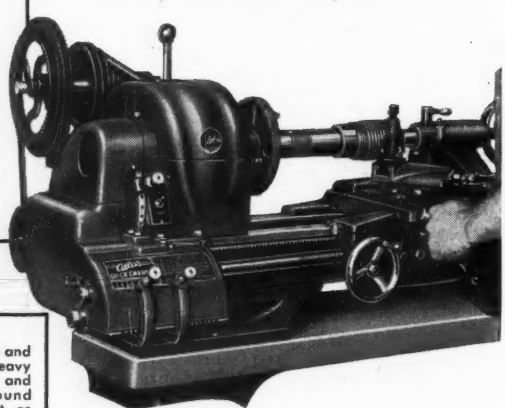
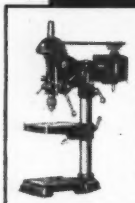


Atlas DRILL PRESSES



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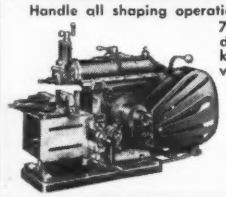
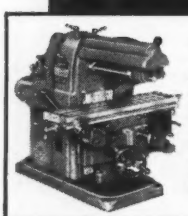


Atlas MILLERS



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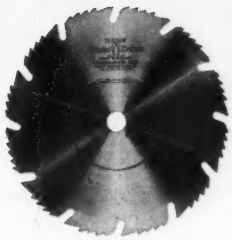
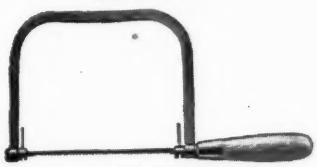


DeLuxe Circular Saws

Band Saws

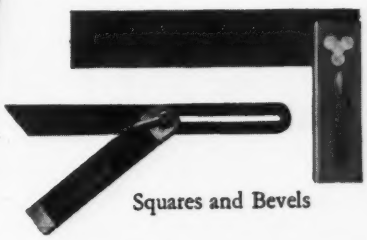
Back Saws

Hack Saw Frames and Blades

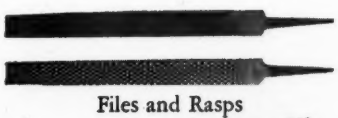


Coping Saws

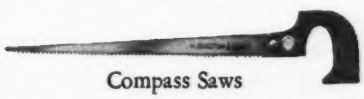
DISSTON Quality Tools for the School Workshop



Squares and Bevels

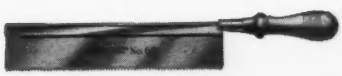


Files and Rasps



Compass Saws

Wood Turning Tools



Dovetail Saws

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School Shop KINKS

Payment will be made for each "Kink" published. Send to the Editor, School Shop, Ann Arbor, Mich.

Cardboard Leads

In most junior-high-school graphic-arts shops, keeping enough leads and slugs available for the students becomes quite a problem, because students of that age have a tendency to break, bend, and carry out leads and slugs.

This problem can be completely solved by using cut pieces of cardboard instead of leads. The cardboard is cut ¾" wide in long strips and then cut to the various picas needed either on the lead and slug cutter or on the paper cutter. In shops where only one job size is used, these cardboards can be placed in a single box and made available to all the students, or they could be placed in the lead and slug racks.

A cardboard may be used which is approximately 2 points thick, thereby making the equivalent of a slug with 3 of them. The torn and battered "leads" may be sorted out and a new lot cut at various intervals and any loss is not at all serious.—*R. W. Engelmeier, Taylor Allderdice High School, Pittsburgh, Pennsylvania.*

Cross-Hatch by Scratch

Most beginning students in drafting courses have difficulty in spacing the cross-hatching lines uniformly on sectional drawings. The result of inaccurate spacing is a poor looking drawing.

This difficulty may be overcome by scratching a guide line parallel to the edge of the triangle and 1/16" from the edge.

Cross-hatching lines can be spaced uniformly by placing the scratched line over the first drawn line, then drawing the second line, moving the scratched line on the triangle over the second line, drawing the third line, and so on until the cross hatching is completed.

Uniformity in the spacing adds greatly to the appearance of drawings with cross-hatched areas.—*William Thompson, Thornton Township High School, Calumet City, Illinois.*

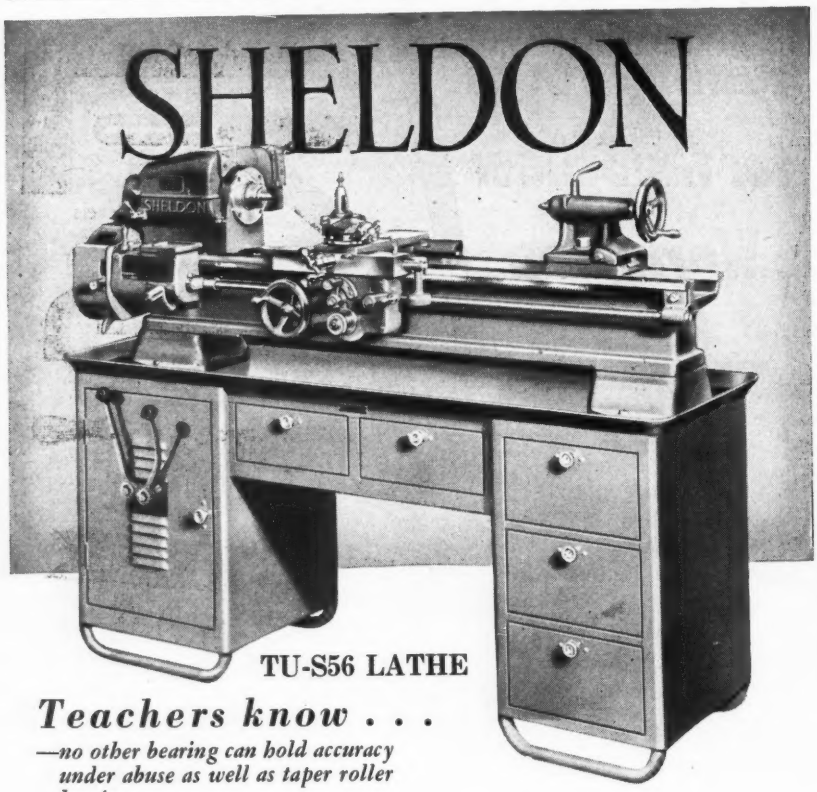
Blackboard Short Cut

Good blackboard drawings can be effective teaching tools. The shop teacher who is not an artist may avoid making blackboard drawings because of his lack of drawing skill.

Machine parts, tools, and other items which the teacher may wish to illustrate on the blackboard can be easily drawn by using an outline template. This template is made of heavy cardboard or light aluminum plate. A tracing or drawing of the object is made on the template in pencil. Holes are then punched at close intervals around the outline with an ⅛" punch. Care must be exercised to place holes accurately and burrs should be taken off so that the template will lie flat on the board.

The pierced template is held flat on the blackboard and an eraser is tapped on it over the holes. The chalk dust will penetrate the holes and leave an outline on the board which can be filled in easily. This procedure saves considerable time, especially if a drawing is used several times a year.—*William H. Freeman, Straubenmuller Textile High School, New York, N. Y.*

SHELDON



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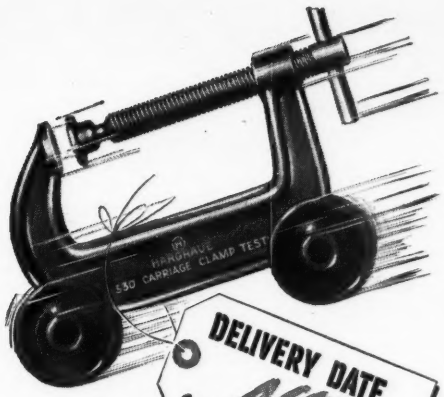

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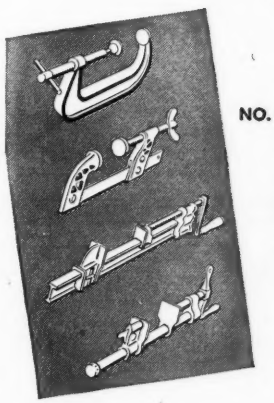

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IN THE Morning Mail...

Brief comments about SCHOOL SHOP and the field it serves are invited. Address the Editor, SCHOOL SHOP, Ann Arbor, Michigan.

Dear Mr. Paca,

In your "From Washington" article in the December issue of SCHOOL SHOP I note that you have been misinformed about the inadequacy of trade and industrial programs for southern Negro youth. . . . Certainly Kentucky is an exception to the rule.

There are 13 area vocational schools in the state, one of which is for Negroes. This is the West Kentucky Vocational Training School at Paducah. It offers only trade courses, is state supported, and is approved by the state and federal governments for veteran training.

Courses are offered in auto mechanics, barbering, carpentry, cabinet making, chef cooking, cosmetology, sewing, and tailoring. All departments are well equipped.

This institution was made a trade school in 1938 and draws students from nine states in addition to Kentucky. . . . Our drawing power must be a reflection of the quality of our program. We have many graduates throughout the country who are making good at their vocations.

At present three new shop buildings are being erected to accommodate new trades, and a building for foundry work has just been completed.

Now, Mr. Paca, you can see that the state of Kentucky is really doing something for its Negro youth in trade and industrial education.

B. W. BROWNE, Coordinator,
West Kentucky Vocational
Training School, Paducah.

[Mr. Paca's response: Nothing would please me more if the other 16 southern states would also take exception to my December letter and come forth with proof of trade and industrial training provisions for Negro youth.]

Gentlemen,

. . . I have been receiving SCHOOL SHOP for as many years as it has been published and I always look forward to each edition. I think it is one of the best little magazines published today.

GUY O. TOLLERUD,
State Dept. of Education,
Minneapolis, Minn.

Gentlemen,

. . . I have always enjoyed SCHOOL SHOP magazine and the same is true of the other members of our faculty. . . . My boys in the shop ask to look at it and many take it home on week-ends. . . . The members of the class have asked me to thank you for the many fine copies of the magazine and I also wish to extend my appreciation.

E. H. BOGUSKI,
Franklin Junior High School,
Green Bay, Wis.

Gentlemen,

. . . I receive SCHOOL SHOP and enjoy it immensely because it has so many practical suggestions.

ALBERT E. JOCHEN,
Director, Vocational Schools,
Middlesex County, N. J.

Gentlemen,

. . . Our men are all receiving SCHOOL SHOP at present and I have heard many favorable comments from the various instructors about it. We look forward to getting this publication every month.

WALTER E. SCHOBER,
H. Cheney Technical School,
Manchester, Conn.

Gentlemen,

I have found SCHOOL SHOP a very interesting magazine and I have used many of the projects in my industrial-arts classes. My boys usually ask for it before I receive the next new issue. Thanks a lot for such splendid service.

CLARENCE E. FOSTER,
Orleans Parish Schools,
New Orleans, La.

Gentlemen,

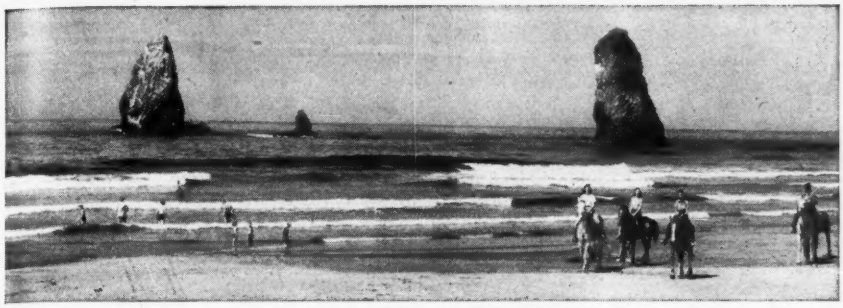
. . . SCHOOL SHOP is splendid. Our students look forward to each copy with anticipation for they know it will be filled with valuable material for teachers of industrial arts.

D. M. BURKHISER, Chairman,
Division of Practical Arts,
Nebraska State Teachers College, Chadron.

EDWARD H. LANG, principal, H. W. Smith Technical and Industrial High School, Syracuse, N.Y., has been named director of the New York State Agricultural and Technical Institute, St. Lawrence University, Canton, N.Y. . . . PAUL T. HISER, formerly with the Veterans Administration, has been appointed assistant professor of industrial arts at Oswego, N.Y., State Teachers College . . . S. E. MCGAW, Oakland, Calif., machine-shop teacher, has been named assistant supervisor of trade and industrial education, California State Department . . . JOSEPH F. SORACE has resigned as a member of the faculty of the department of graphic arts of the Rochester Institute of Technology to enter industry . . . CHARLES FERRELL, former machine-shop instructor at San Luis Obispo, Calif., has been named coordinator of industrial education for Contra Costa County, Calif. . . . LESLIE S. BURNELL has retired after 26 years of teaching industrial arts in the Senior High School, Lynn, Mass. . . . BURL L. DOUGHERTY, principal of the Koscuiszko Junior Trade School, Milwaukee, Wis., died recently at 61 years of age . . . L. A. LE ZOTTE, former director of vocational education for Puerto Rico, is now in Brazil with the Inter-American Educational Foundation. . . . LORENZO GARCIA has been named director in Mr. Le Zotte's place . . . TOM DEAN has been appointed a member of the industrial-education faculty at Iowa State College, Ames . . . C. W. MCINTOSH has been named a member of the indus-

(*Continued on page* 22)

A Cool Western Summer School where the Mountains Meet the Sea



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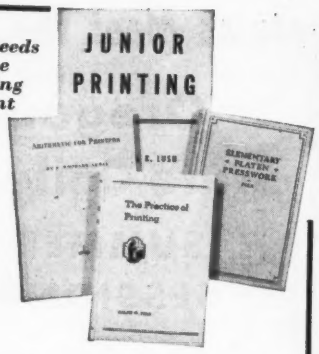

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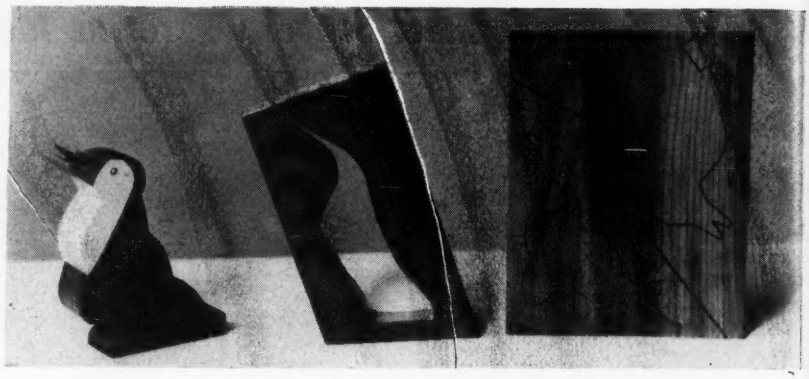


Penguin for Used Blades

BY *Arthur F. Schuster*

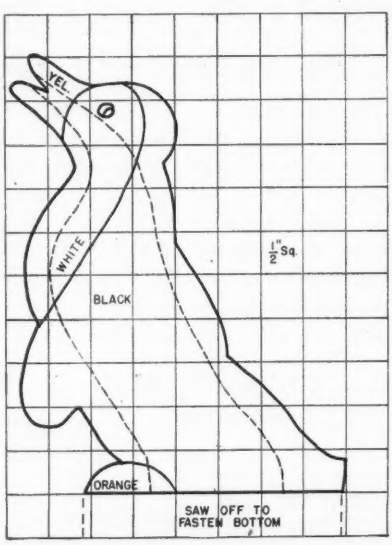
Teachers of beginning woodworking will find this simple project of interest to the students and useful in teaching elementary skills. Arthur F. Schuster teaches at the Gaskill Junior High School, Niagara Falls, N.Y.

TESTED 55 PROJECT

THIS project is an ornamental accessory for the bathroom. In homes where no provision is made for the disposition of used razor blades, the penguin used-blade holder is a welcome addition to the household equipment.

When the holder is filled to capacity, it can be emptied into the trash barrel by removing the bottom.

This project can be made in any shop where boys are allowed to use a jig saw. It is a practical project for elementary woodworking and only a small amount of material is required for its construction. In fact, boys will be able to salvage short pieces of 2″ x 4″ from which to cut the stock. A piece of ¼″ white pine or basswood 6″ x 8″ is the only other material required except for finishing materials and screws.



The procedure for construction is as follows:

1. Rip 2″ x 4″ to 1″ thick.
2. Trace pattern and saw out center, following the broken lines on the drawing. Allow ½″ to project at bottom.
3. Trace patterns on ¼″ stock. Saw along center line to separate pieces.
4. Register and glue sides to center piece.
5. Saw along outline. Cut off bottom of center piece.
6. Cut and fasten piece to bottom. Use ⅜″ x 6 flathead screws.
7. Sandpaper and paint.

Strictly Personal . *from page 20*

trial-arts staff of Memphis, Tenn., State College . . . A. W. MEYN, formerly in the Canal Zone, has been appointed director of vocational education for the Poughkeepsie, N.Y., schools. . . . WILLIAM B. HAWLEY has been named assistant state director of vocational education for Michigan. He was formerly state supervisor of trade and industrial education. . . . M. D. DARROW, Hadley Vocational School, St. Louis, Mo., has been appointed to the faculty of the trade and industrial education department of Texas A & M College. . . . LE ROY A. BLASER, assistant superintendent in charge of vocational education, Ogden, Utah, has accepted an appointment to serve with the Institute of Inter-American Affairs in Rio de Janeiro, Brazil, as a specialist in job analysis. . . . DAVID JACKEY has been named dean of the school of applied arts, University of California at Los Angeles. . . . MAX YARBROUGH has succeeded ANDREW TRICHE, resigned, as state supervisor of trade and industrial education for Louisiana.

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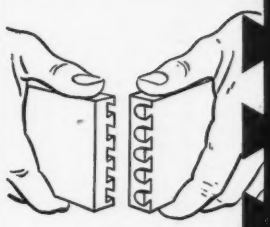

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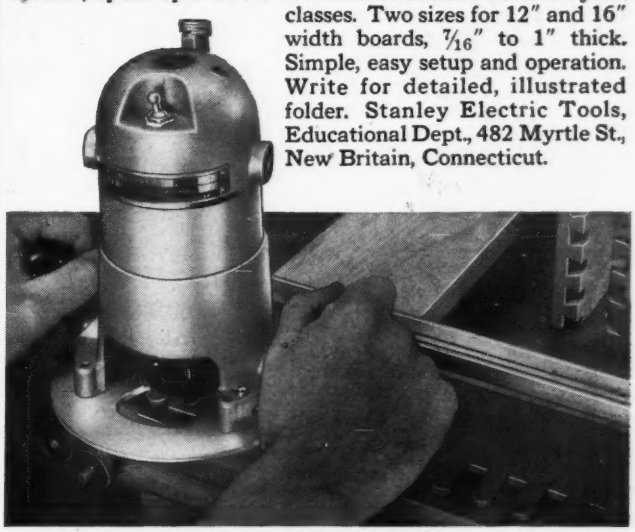

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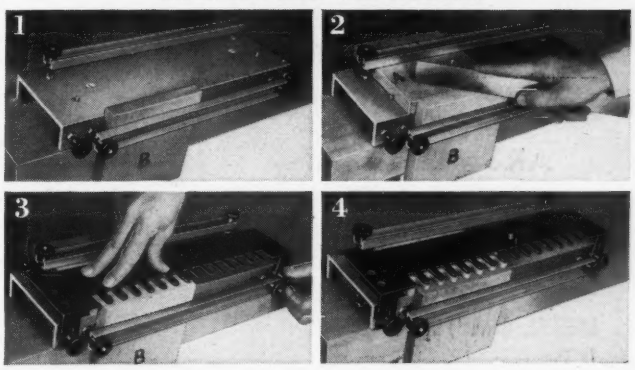

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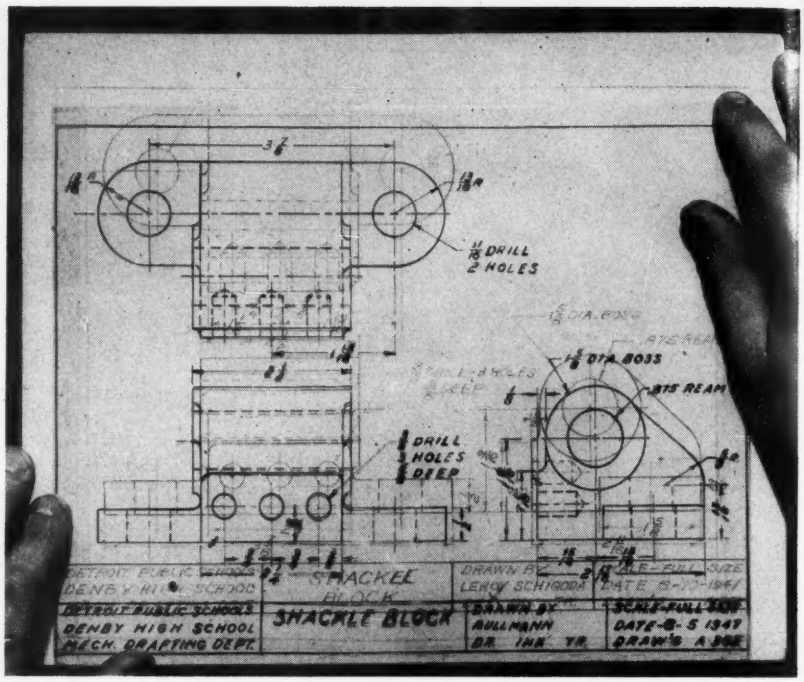

Check Drawings Quickly

BY *Leonard E. Larson*

This device for checking mechanical drawings is readily made and will save much time in going over plates. Leonard E. Larson teaches at Denby High School, Detroit, Michigan.

What it is: This checking device consists of a thin piece of transparent plastic material on which an accurate drawing is made with black india ink. It resembles an ordinary inked tracing.

How it is used: This transparent checking device is placed over the student's work in such a way that one view of the device coincides with the corresponding view of the student's drawing. It is thus a simple procedure to check the layout, dimensions, and lines, and to spot possible errors or omissions.

The device can then be shifted slightly so that other views can be made to coincide. Each view is checked in the same manner as the first view.

How I made mine: In making this device, I took an 8½" x 11" plastic sleeve (envelope) which I purchased at one of the local stationery supply houses, and fastened it over the drawing on the drawing board. I then folded back the top half of the plastic material and made the drawing on the inside half.

Before inking, I first tried using powder on this smooth glossy surface but I discontinued doing this because it tended to cloud the transparency of the material. It also acted as an abrasive on the inked lines when I cleaned the finished drawing.

It was necessary to exercise much care when inking, however, especially on the dimensions and lettering, because they tended to become too heavy. Sometimes blotches did occur, but they were easily removed by rubbing with a slightly moistened cloth.

After completing the drawing, I checked it thoroughly for completeness and accuracy and then wiped it with a clean cloth to remove all traces of dust and finger prints. As a final step I sealed the sides and bottom with transparent tape so as to make the device more rigid and durable.

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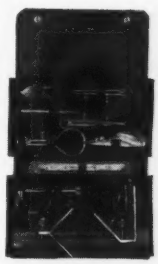

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Instructional RESOURCES

Masonry Simplified. Vol. I. Dalzell and Townsend. Chicago: American Technical Society, 1948. Pp. xi+367. $4.50.

This first volume of a two-volume series is an excellent presentation of the tools, materials, and practices of masonry and will be of real use to the building-trades instructor. The first three chapters deal with cementitious materials. The next chapter deals with blueprint reading as applied to masonry, an important teaching tool. The following three chapters cover unit masonry while the final chapter is on sidewalks, drives, and stairways. Teachers will find the series of questions and answers and review questions at the end of each chapter a teachable feature. Many excellent photographs and line drawings will aid the student in understanding the text.

J. Ralph Dalzell is head of the Architectural Engineering Department of the American School and managing editor, American Technical Society. Gilbert Townsend is a member of a firm of architects and engineers, Montreal, Canada.

Sheetmetal Mathematics. Albany, N.Y.: Delmar Publishers, Inc., 1947. Pp. xiii+263. $2.75.

This is a publication of the New York State Vocational and Practical Arts Association and was prepared by a group of teachers from the Buffalo, N. Y., Vocational Schools under the supervision of Robert W. Schrott. The fundamental principles of mathematics related to sheetmetal work were studied, defined, and applied in this text. It is organized in the form of two types of instructional units: basic principle units and assignment units. The first contains an explanation of the mathematics under consideration and the derivation and application of formulas. Related to this presentation is the second series of units on assignments which contain sufficient problem material of the drill and trade-problem variety to give the student mastery of the principle. This results in a very teachable presentation of the subject. Numerous illustrations, problems, formulas, and tables aid the student.

Industrial Apprenticeship. Bergevin. New York: McGraw-Hill Book Co., Inc., 1947. Pp. xv+280. $2.75.

Opening with a short history of the apprentice movement, this book then contains a detailed discussion of the principles of industrial apprenticeship. This section covers planning and administration, shop instruction, related instruction, and selection. The final chapter describes the application of the principles for the purpose of evaluation of an existing program or initiation of a new program. The appendix contains a valuable collection of forms and materials used in operating a program. Persons in charge of apprenticeship programs and those intending to institute such programs will find this book an excellent source of stimulating material for comparison and for descriptions of up-to-date practices in the field.

Paul Bergevin is Director of Industrial and Adult Education, Anderson, Ind., Public Schools.

Adventures with Plastics. Newkirk, Hewitt, and Zutter. Boston: D. C. Heath and Co., 1947. Pp. x+275. $3.50.

Teachers of industrial arts will find this volume an excellent presentation of the subject of plastics. The first chapter outlines the methods of working plastics with common tools and machines. The next eight chapters are devoted to project designs and construction methods. The final chapters contain material on various types of plastics and industrial processes of plastics fabrication. The appendix gives helpful information on ordering supplies. Numerous photographs and line drawings show in detail the construction procedures for the projects.

Louis V. Newkirk is Director of Industrial Arts, Chicago Schools, and Coleman Hewitt is a member of the staff of Chicago Teachers College. LaVada Zutter is a designer and illustrator and former teacher in the Chicago, Illinois, public schools.

Fundamentals of Carpentry. Vol. I—Tools, Materials, Practice. Vol. II—Practical Construction. Durbahn. Chicago: American Technical Society, 1948. Vol. I, Pp. xi+336, $3.25; Vol. II, Pp. xi+444. $4.25.

This two-volume series is a complete course of study for students and apprentices in carpentry. The first volume gives background material on carpentry including discussions of woods, wood fastenings, and other topics. Skill development is covered in such topics as carpentry tools, insulation, and blueprint reading. An extensive list of tables and a "Dictionary of Carpentry Terms" in the appendix are very helpful.

The second volume outlines in complete detail the steps involved in the construction of an actual house from foundation construction through interior finish. An additional chapter covers construction of typical farm buildings. Specifications and blueprints are included for this house and all details of construction are covered.

Both volumes contain helpful teaching material in the form of outline questions at the head of each chapter and review questions at the end. Numerous illustrations show the student each operation in detail. These books will be found to be extremely helpful to teachers of carpentry.

Walter E. Durbahn is chairman of the Department of Vocational Education, Highland Park, Ill., High School.

Illustrated Jig-Tooling Dictionary. Thompson and Peterson. New York: The Macmillan Co., 1947. Pp. v+349. $7.50.

Over 1,000 tool terms are defined and each is illustrated by functional drawings in this useful reference book. Particular attention has been paid to the latest precision equipment, stressing specific functions, proper use, and methods of obtaining and interpreting calibration results. Typical tooling procedures are illustrated and explained. The appendix contains 26 charts and tables. The machine-shop teacher will find this a very useful addition to the shop library.

Torger G. Thompson was formerly tool designer at North American Aviation, Inc., and Ross A. Peterson is director of the Texas Trade School.

Employment Outlook in Machine-Shop Occupations is a pamphlet listing job prospects, duties, training, earnings, and working conditions in machine shops throughout the country. Teachers of machine shop will find this excellent guidance material. Available from the U. S. Government Printing Office, Washington 25, D. C., for 20 cents.

Invitation to Live is a 74-page pamphlet which outlines the fundamentals of safety in the home, shop, and highway. A short section is devoted to first-aid procedures. It was prepared in cooperation with the National Safety Council. Copies are available for 16 cents to National Safety Council members and 32 cents to others from the Printograph Co., Kansas City, Mo.

Technical Lettering—A Unit of Drafting is a new series of slidefilms produced by the Jam Handy Organization and designed to aid teachers of drafting to show actual strokes and proportions of letters to students. The introductory film shows uses of lettering, characteristics of single-stroke gothic letters, and similarities between letters. The other four films give instructions for making vertical capitals. Questions, reviews, and practice suggestions are included in each film. The kit price is $18. Single films are $3.75 each. For details write the Jam Handy Organization, 2821 East Grand Blvd., Detroit 11, Mich., mentioning SCHOOL SHOP, or contact the distributor in your area.

Fabricating the Western Pines is a 16mm sound film which portrays the fabrication and assembly of sash, doors, frames, and screens and the proper installation of such units in house construction. The action shows various units of the mill in action, including manual and machine operations. Available on free loan except for transportation one way from the Western Pine Association, Yeon Bldg., Portland 4, Ore.

Harvesting the Western Pines is a 16mm sound film which covers logging operations and lumber manufacturing. The complete operation from felling the timber to shipping out the dressed lumber is covered. Available at no charge except for transportation one way from the Western Pine Association, Yeon Bldg., Portland 4, Ore.

SHOP BOOKS

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Machine Woodworking—1948 Edition. A standard instruction manual on the common woodworking machines. Covers thoroughly the operation of each. Stresses safety procedures. Cloth cover, **$2.75**

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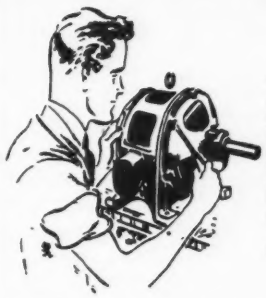

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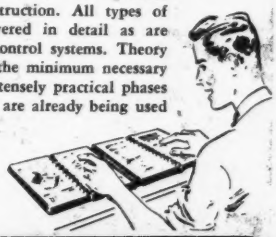

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News from INDUSTRY

Allen Course Again Available

Allen Electric & Equipment Company is again offering its widely known course in engine operation and analysis, tune-up, and repair. The course, which was used to train thousands of civilian and Army mechanics prior to and during the war, consists of 12 sections, each covering a different phase of engine diagnosis, tune-up, and repair. The latest factory-approved methods are demonstrated and the newest and most modern tune-up equipment is used for instruction. The student receives valuable textbooks, as well as personal instruction.

The Allen course is available through Allen jobbers in every part of the country. Those desiring complete information on the Allen course, "Modern Engine Tune-up" should contact the local Allen jobber; or write direct to Allen Electric and Equipment Co., 2000 N. Pitcher St., Kalamazoo, Mich.; *or check no. 25 on the coupon.*

The Hobbypress

A new development in which shop teachers will be interested is an inexpensive yet efficient press for sealing and laminating in plastics, wood, and paper. Known as the Hobbypress, this ingenious new press can apply up to two tons of pressure, yet is light in weight, compact, and costs only a fraction of what might be expected.

The Hobbypress accepts objects up to 4 by 5 inches in size. Pressure is accurately controlled by means of a heavy alloy steel spring. Heating may be done from any dependable heat source. Ideal for sealing such articles as photographs, cards, etc., between plastic, the press also does wood and paper laminating, glues solid blocks, and is suitable for various kinds of forming and embossing of both metals and plastics. For complete information write Fry Plastics Co., 7606 S. Vermont Ave., Los Angeles, Calif.; *or check no. 26 on the coupon.*

Electrode Wall Chart

A 25" x 35" electrode wall chart, printed in full color, has just been published by the Hobart Brothers Company.

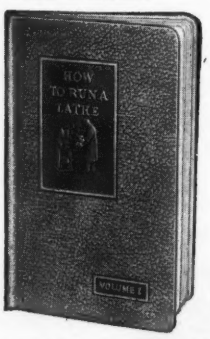
This handy wall chart shows procedures for every type of arc welding electrode; actual results of too long or too short an arc, too much or too little welding heat, too fast or too slow a welding speed, and then illustrates a perfect bead as well as a cross section of all welds; and complete illustrated welding symbols for both fusion and resistance welding.

A free copy of the chart may be had by writing The Hobart Brothers Co., Troy, Ohio, mentioning SCHOOL SHOP; *or by checking no. 27 on the coupon.*

Prefab Trailer Kits

Prefabricated kits of ready-to-assemble parts for practical and attractive sports trailers are being offered by National Trailer Stores. Completely guaranteed, all that is needed to assemble the trailer is a screw driver and a good wrench. The organization serving craftsmen throughout this and foreign countries claims that the same trailer ordinarily costing $500 can be built at great savings by using their prefabricated kit containing everything needed for a professional job. A detailed explanatory folder may be obtained without cost from National Trailer Stores, Box 2353 Terminal Annex, Los Angeles, Calif.; *or by checking no. 28 on the coupon.*

"How to Run a Lathe"



The South Bend Lathe Works has recently issued the 45th edition of its popular book, *How to Run a Lathe.* A number of changes in text material and illustrations have been made since the previous edition was printed in 1944.

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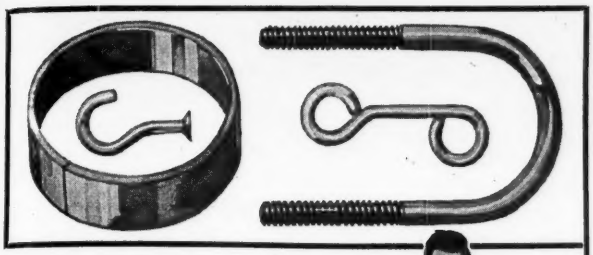

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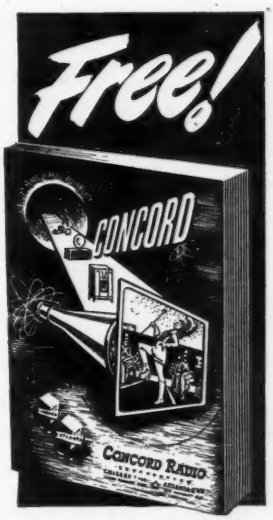

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Washington . . . . from page 32

(4) "In order to be consistent with *Policy Bulletin No. 1* which provides for advisory committees on the local and state level, provide on the national level a federal advisory committee for vocational education consisting of lay representatives representing the various fields of vocational education including labor and management."

(5) "Reschedule regional conferences after July 1, 1948, and make certain that they are *cooperatively planned* and conducted with the states."

(6) "Assure that the Director of the Vocational Division of the U. S. Office of Education shall work in close cooperation with the Executive Committee of the American Vocational Association to make possible an understanding on the part of vocational leaders with respect to budget requests."

AVA Group Dissatisfied

I cannot say what assurances the AVA group received that its requests will be carried out. I can say that even after the meeting there persists a feeling in the Office of Education that the present organization of the Vocational Education Division is satisfactory; that few if any basic changes are needed. So far as the request for more professional services are concerned, the Office of Education believes it is possible to attain this as soon as Congress approves the Office of Education request for additional funds for travel and for printing.

For 1949, the Commissioner of Education asked for $142,000 for travel, or $52,000 more than was granted for 1948. If these additional funds are approved by Congress, the Commissioner of Education will allocate them so that there will be available $1,000 for every professional member in the Vocational Education Division (as against $500 for every professional member in the rest of the Office of Education.)

The Commissioner of Education also told the group that he is seeking a larger printing appropriation in order to make possible a larger volume of technical and service documents for the states.

These plans of the Office of Education, however, did not make the AVA group very happy. It left with the general feeling that it did not receive much satisfaction from the visit.

The next steps lie in the future. But the AVA leadership will continue its opposition to any effort to "strangle and devitalize vocational education through a process of integration." It will continue to oppose "carrying integration to the extent where vocational education will lose its genuineness and, in turn, will lose the support of the economic groups we are trying to serve."

Watch for the April Issue!

THE April issue of SCHOOL SHOP will contain the directory features which make it a valuable addition to your professional library for use throughout the year. The Suppliers Directory will give you the names and addresses of the firms producing materials used in industrial-education classes. Other directories featuring officials and association will be handy for reference. Keep your April Directory Issue for use through the year.

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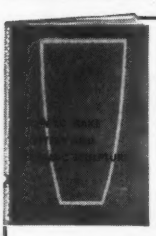
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MY visit to the American Vocational Association offices for more facts on C. M. Miller's charges against the federal Vocational Education Division took place at an opportune time. [Editor's Note: See pages 7-8, February issue.] It coincided with a conference of 18 top-leaders of the AVA who had come to Washington from several states to map out steps which would bring about a "sound set-up for the administration of vocational education at the national level."

I came prepared with several questions. I wanted to know:

1. To what extent did Mr. Miller's criticism of the Vocational Education Division represent the thinking of the state leaders?

2. What new plan does the AVA leadership suggest in place of the one now in force at the Office of Education?

3. What steps the AVA is taking or planning to take to bring about the changes it wants?

Answer Number One

The men who were meeting in the rather crowded quarters of the AVA headquarters in Washington interrupted their conference to receive me—which they did most courteously. The introductions showed that present in the group were five past presidents of the AVA, and leaders from Georgia, Massachusetts, Kansas, Pennsylvania, Texas, Oklahoma, Ohio, Wisconsin, California, New York, and other states. Newly-elected AVA President Julian McPhee was there; as was Mr. Miller. "There's a total of 500 years of vocational education experience here in this room," some one remarked.

After being seated in a comfortable chair, I told the reasons for my visit. President McPhee promptly proceeded to answer my first question by reading the following statement:

"More than half of the members of the AVA Executive Committee and other AVA leaders, 18 in all, representing a number of states and all sections of the nation, met in Washington on January 26, 1948. It was the opinion of this group that the address by C. M. Miller at the Los Angeles AVA Convention on Deceber 16, 1947, accurately represented the thinking and feelings of the great majority of the state vocational educational forces of the entire country.

"The group recalled the fact that when Mr. Miller made his address it was so warmly and enthusiastically received that he was accorded a spontaneous standing ovation of great length.

"As evidence of the dissatisfaction of the State Directors of Vocational Education with the present organization of the U. S. Office of Education for the administration of vocational education, the group directed attention to the fact that the State Directors on Monday, December 15, 1947, passed a strong resolution with only two dissenting votes requesting that the Executive Committee of the AVA initiate and/or support appropriate and necessary measures to see that a sound set-up for the administration of vocational education is reestablished and maintained at the national level."

Conference with Gregory and Studebaker

Answers to my two other questions emerged during the next few days. The 18 men had come together in Washington to set down in detail the changes they wished to see in the Vocational Education Division and to bring their views to the personal attention of the leadership in the Office of Education. On the day of my visit to the AVA they were still in the midst of formulating their plan of action.

The AVA conference lasted three days. Having formulated their platform, the AVA group called on Commissioner Studebaker and Assistant Commissioner for Vocational Education Gregory on January 27. The meeting in the new Federal Security Building was a closed one. But I can report that the AVA group laid before the federal officials these requests:

(1) "Restore the position of Assistant Commissioner for Vocational Education." (This position still exists in the current organization charts of the Office of Education, and is listed in both the latest *Federal Register* and the *Congressional Directory*. The AVA's concern over the Assistant Commissionership is aroused by the fact that the current federal budget does not carry a salary appropriation for Assistant Commissioner, but rather for the Director of the Vocational Education Division.)

(2) "Reestablish regional agents in all of the services with one of these agents in each of the regions to serve as administrative coordinator between the state and the Assistant Commissioner for Vocational Education."

(3) "Provide sufficient travel funds for the vocational education professional staff to make adequate professional service possible. Such funds are to be earmarked for the use of the Vocational Division of the U. S. Office of Education under the provisions of the Smith-Hughes and George-Barden Acts."

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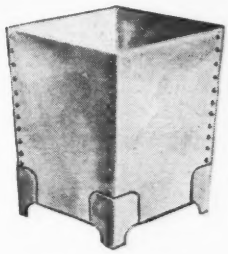

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